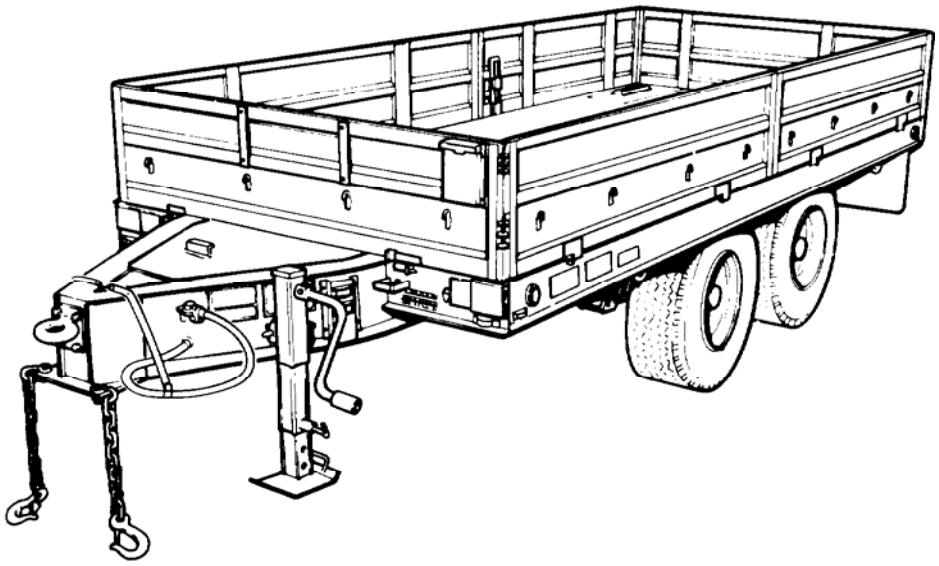
TECHNICAL MANUAL

Operator, Field and Sustainment Maintenance Manual Including Repair Parts and Special Tools List

for

TRAILER, AMMUNITION, HEAVY EXPANDED MOBILITY, 11 TON, M989

(2330-01-109-4258)



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HEADQUARTERS, DEPARTMENT OF THE ARMY

December 1985

PIN 059505-0002

WARNING SUMMARY

WARNING

Protective eye covering should be work at all times to prevent personal injury.

WARNING

Vent air tanks of air pressure before removal of air system components to prevent possible injury.

WARNING

Keep away from drain cocks when draining air tanks to prevent injury to eyes by compressed air.

WARNING

Do not attempt to dismount tire until tire has been completely deflated. When released, air under pressure can cause serious injury.

WARNING

DO NOT use a dry brush or compressed air to clean brake shoes. There may be asbestos dust on brake shoes which can be dangerous to your health if you breath it. (Dampen surface of lining with water and use a soft bristle brush.)

WARNING

Do not attempt to pull landing leg plunger unless trailer is connected to towing vehicle pintle if trailer is loaded. The load may cause trailer to tip forward and cause injury.

WARNING

Asbestos dust is dangerous to your health. Wear respirator to avoid inhaling dust.

WARNING

Chemical Agent Resistant Coating (CARC) paint contains Hexamethylene Diisocyanyte (HDI), which is highly irritating to the skin and respiratory system. High concentrations of HDI can produce symptoms of itching and reddening of the skin, a burning sensation in the throat and nose, and watering of the eyes. In extreme concentrations, HDI can cause cough, shortness of breath, pain during respiration, increased sputum production, and chest tightness. The following precautions must be taken whenever using CARC paint:

- NEVER cut CARC-coated materials without high-efficiency, air-purifying respirators in use.
- DO NOT grind or sand painted equipment without high-efficiency, air-purifying respirators in use.
- BE AWARE of CARC paint exposure symptoms; symptoms can occur a few days after initial exposure. Seek medical help immediately if symptoms are detected.
- ALWAYS wear protective equipment (gloves, ventilation mask, safety goggles, etc.).

WARNING SUMMARY (continued)

WARNING

Coatings can cause internal injury during prolonged breathing of vapors. Wear respirator to prevent inhaling vapors. Use adequate ventilation.

WARNING

Do not attempt to disassemble brake air chambers. The springs inside the chamber are under heavy tension and may cause severe injury if released during disassembly.

WARNING

Spare tire will drop to the ground as soon as ratchet is released. Stand clear to prevent possible injury.

WARNING

Solvent cleaning compound is an environmentally compliant product and is low in toxicity. However, it may be irritating to the eyes and skin due to its base stock. The use of protective gloves and goggles is required. Use the cleaning compound in well-ventilated areas and keep away from open flames and other sources of ignition.

WARNING

Do not actuate the trailer parking brake control unless the HEMAT is on level terrain. Without brakes the HEMAT may roll and move out of control causing possible injury or damage.

WARNING

Do not stand between towing vehicle and HEMAT when backing towing vehicle. Serious injury can result if personnel are caught between the vehicles.

CHANGE
No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 15 March 2007

Operator, Field and Sustainment Maintenance Manual Including Repair Parts and Special Tools List

for

TRAILER, AMMUNITION, HEAVY EXPANDED MOBILITY, 11 TON,
M989 (2330-01-109-4258)

MODEL	NSN
TRAILER, AMMUNITION, HEAVY EXPANDED MOBILITY, M989	2330-01-109-4258

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1. Remove old pages and insert new pages as indicated below.
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Remove Pages	Insert Pages
Warning Summary	a and b
A and B	A and B
i through iii/iv blank	i through iv
1-1 and 1-2	1-1 and 1-2
4-1 through 4-7/4-8 blank	4-1 through 4-7/4-8 blank
4-13 through 4-16	4-13 through 4-16
4-21 through 4-26	4-21 through 4-26
5-1 through 5-4	5-1 through 5-4
5-7 through 5-10	5-7 through 5-10
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7-1 and 7-2	7-1 and 7-2
8-1/8-2/blank	8-1/8-2/blank
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7-1 through Figure 8	7-1 through Figure 8
12-1 through Figure 15	12-1 through Figure 15
I-1 through I-12	I-1 through I-12
Index 1 through Index 4	Index 1 through Index 4
Front Cover	Front Cover

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NO. 1

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DEPARTMENT OF THE ARMY
Washington D.C., *15 December* 1991

Operator's, Organizational, Direct Support, and General Support Maintenance Manual with Repair Parts and Special Tools Lists

TRAILER, AMMUNITION, HEAVY EXPANDED MOBILITY, 11 TON, M989 (2330-01 -1 09-4258)

Current as of 8 May 1991

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4-1 and 4-2	*4-1 and 4-2*
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B-5 and B-6	*B-5 and B-6*
C-1 and C-2	*C-1 and C-2*
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9-1 through Figure 13	*9-1 through Figure 13*
17-1 and Figure 18	*17-1 and Figure 18*
Bulk- 1 and "Bulk-2"	*Bulk- 1 and "Bulk-2°*
/-1 *through "I-8"*	*i-l through i-12*
index 1 through index 4	*/ndex 1 through* Index 4

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Dates of issue for original and updated pages/work packages are:

Original.....15 December 1985
Change 1 .....15 December 1991
Change 2 .....15 March 2007

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 230
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b	2	2-19	0	4-8 Blank	0
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No. 9-2330-368-14&P

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WASHINGTON D.C., 15 DECEMBER 1985

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for

TRAILER, AMMUNITION, HEAVY EXPANDED MOBILITY, 11 TON, M989

(2330-01-109-4258)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (Recommended Changes to Equipment Technical Publications) through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is http://aeps.ria.army.mil. The DA Form 2028 is located in under the Public Applications section on the AEPS public home page. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond more quickly to your comments and better manage the DA Form 2028 program. You may also mail, fax, or e-mail your letter or DA Form 2028 directly to AMSTA-LC-LMIT/TECH PUBS, TACOM-R1, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The e-mail address is ROCK-TACOM-TECH-PUBS@conus.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

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1-1. SCOPE

a. Type of Manual: Operator's, organizational, direct support, and general support maintenance (including repair parts and special tools list (RPSTL).

b. Model Numbers and Equipment Name: M989 – Heavy Expanded Mobility Ammunition Trailer (HEMAT), 11 Ton.

c. Purpose of Equipment: Designed for transporting 22,000 pounds (9979.2 kg) of payload.

(1) Four evenly distributed MLRS pods side by side, two high or

(2) Eight 40 by 48 inch ammunition pallets.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 750-8, The Army Maintenance Management System (TAMMS) User's Manual.

1-3. HAND RECEIPT (-HR) MANUALS

Hand receipt manual is not required for this equipment.

1-4. DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE

Refer to TM 750-244-6, Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use, for procedures on destruction of military vehicles.

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your HEMAT needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. If you have Internet access, the easiest and fastest way to report problems or suggestions is to go to https://aeps.ria.army.mil/aepspublic.cfm (scroll down and choose the "Submit Quality Deficiency Report" bar). The Internet form lets you choose to submit an Equipment Improvement Recommendation (EIR) or a Product Quality Deficiency Report (PQDR). You may also submit your information using an SF Form 368 (Product Quality Deficiency Report). You can send your SF Form 368 via e-mail, regular mail, or facsimile using the addresses/facsimile numbers specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual. We will send you a reply.

1-6. WARRANTY

The M989 HEMAT Trailer is warranted by the Beta Manufacturing Company, parts only, for a period of 12 months after the Government acceptance date. For further warranty provisions and for instructions on filing warranty claim, see Appendix I.

1-7. PREPARATION FOR STORAGE OR SHIPMENT

Refer to TM 38-470, Storage and Maintenance of Army Prepositioned Stock Materiel, for preservation, packaging, marking, and preparation for storage or shipment of the M989 series HEMAT.

1-8. SAFETY, CARE, AND HANDLING

Deleted

1-9. LIST OF ABBREVIATIONS

The following abbreviations are used in this technical manual:

HEMAT	Heavy Expanded Mobility Ammunition Trailer
HEMTT	Heavy Expanded Mobility Tactical Truck
LH	left hand
MLRS	Multiple Launch Rocket Systems
RH	right hand
SPLL	Self Propelled Loader Launcher

1-10. METRIC UNITS

The equipment described herein is non-metric and does not require metric common or special tools; therefore, metric units are not supplied. Tactical instruction will include metric units in addition to English units. Clarity of instruction is not impaired.

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1-11. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

- Can be towed by HEMTT and SPLL.
- Can carry up to 22,000 pounds (9972.2 kg) of munitions cargo at 50 mph (80.5 kph) highway only.
- Gates may be installed or removed.
- Has blackout lights.
- Has jackknife warning indicators.

1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

a. Coupler(1). Attaches to towing vehicle pintle for towing operations.

b. Safety Chains (2). Attach to towing vehicle to prevent breakaway.

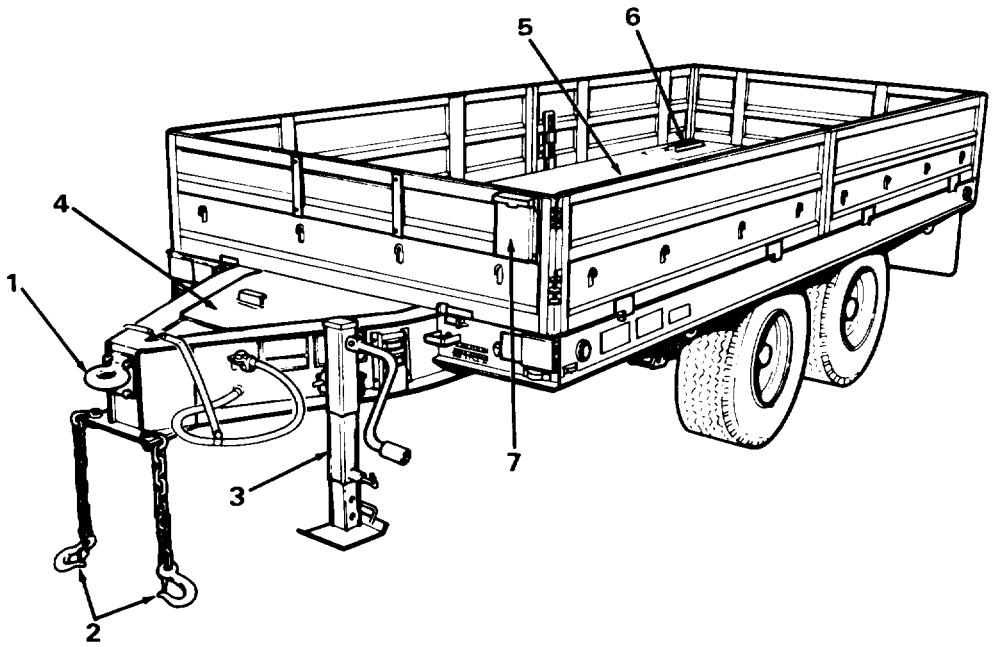
c. Landing Gear (3). Supports front end of HEMAT when not connected to towing vehicle. Stowed in the horizontal position when HEMAT is hooked up.

d. Storage Box (4). For storage of intervehicular air hoses and cable, fire extinguisher, SPLL adapter, lug wrench and other tools. Cover hinged in rear, located forward in tongue. Provided with support strut to hold in open position and latch.

e. Tie Down Rings (5). Used to secure cargo. Are recessed in frame pockets.

f. Pod Stops (6). One in each comer of the bed to permit anchoring MLRS pods.

g. Manifest Holder (7). Used to store cargo manifests.



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1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (cont)

h. Tandem Axles(8). Consists of the suspension system, air brake system, axles, and the tires.

i. Frame (9). Constructed of steel with a wooden floor. Provides the load bearing surface, the mounting for the axles and suspension, and the mounting for the coupler.

j. Service Brakes (10). Brakes are applied to HEMAT wheels through towing vehicle air system, and intervehicular air hoses.

k. Gates (11). Used to retain cargo within floor area when raised and locked in position. Are hinged on the frame for quick installation and removal.

1. Lifting Eyes (12). Slide bolt type located at corners of frame for lifting entire trailer when extended. Can be locked in retracted position.

m. Rubber Bumpers (13). Prevents damage to the HEMAT and the dock when moving the HEMAT into the dock for loading or unloading.

n. Lights (14 and 15). Consists of the clearance marker, stop, blackout and turn signal lights, Actuated by towing vehicle through intervehicular cable.

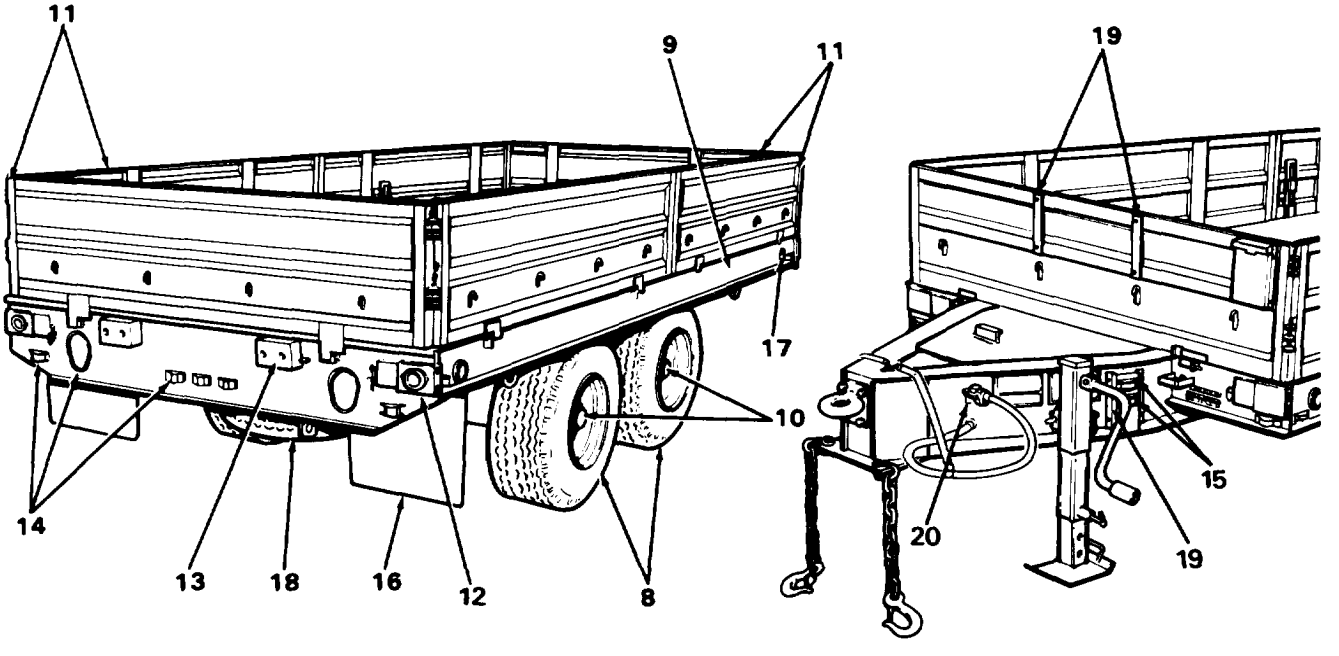
o. Splash Guards (16). Keeps mud and water from being splashed off the rear tires during rainy weather. Will also keep most of the rocks thrown up when traveling unimproved roads from being thrown off to the rear.

p. Reflectors (17). Provide more visibility of HEMAT in addition to lights.

q. Spare Tire Carrier (18). Carries spare tire and permits raising and lowering of tire for use.

r. Jackknife Warning Indicators (15 and 19). Consists of tongue-mounted clearance marker lights (15) and black vertical markings (19).

s. Intervehicular Air Hose Dummy Couplers (20). Located on the trailer tongue, provides stowage connection for air hoses.



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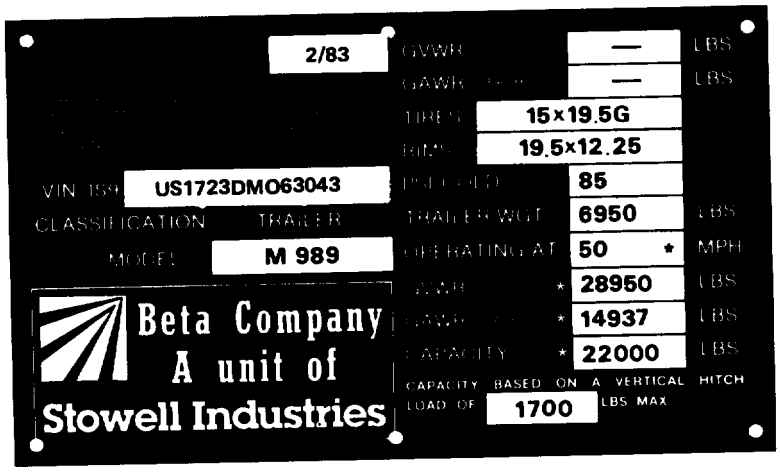
1-13. EQUIPMENT DATA

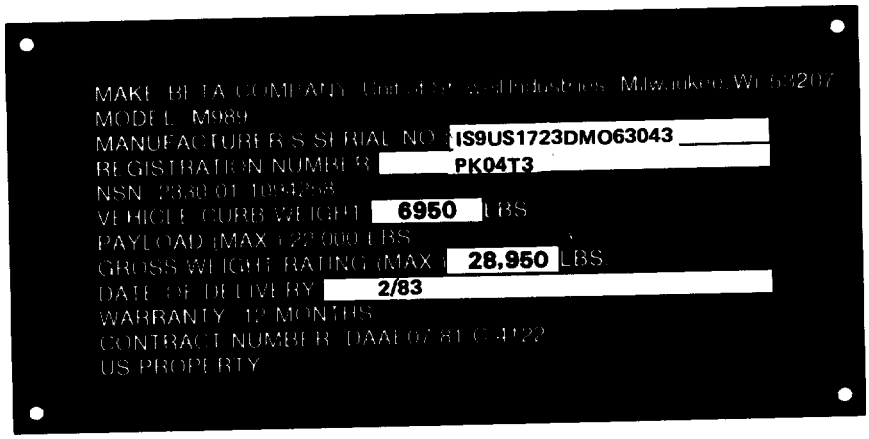
Height	**68in. (1727.2 mm)**
Length	**265 in. (6.73 meters)**
Width	**96 in. (2438.4 mm)**
Weight	
Empty	**6,950 lbs. (3 152.5 kg)**
Payload	**22,000 lbs. (9972.2 kg)**
Tires	
Size	**15:00 x 19.5, load range G 14 ply**
Inflation Pressure	**85 psi (4.07 Kpa)**
Wheels and Rims Size	**19.5 i nch x 12.25 inch**
Axles	
Manufacturer	**Dana-Rockwell**
Model Number	**D-21**
Capacity	**44,000 lbs. (1995.8 kg)**
Brakes	
Manufacturer	**Dana-Rockwell**
Type	**Drum, 16-1/2 inches x 7 inches**
Landing Gear	
Manufacturer	**Stowell Industries Inc.**
Model Number	**48000**
Type	**Telescopic, manual, handcrank**
Capacity	**8,000 l bs. (3628.8 kg)**
Suspension	
Manufacturer	**Reyco**
Type	**HW Slipper Spring**
Air System	
Manufacturer	**Bendix**
Type	**FMVSS-121**
Electrical System	**24dc negative ground**
Fire Extinguisher	**Type 10BC**

1-14. DATA PLATES

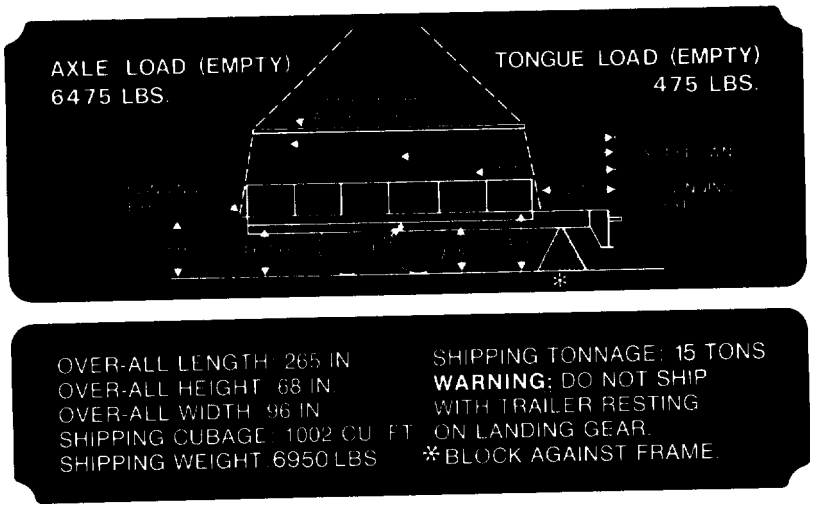
Sample data plates shown below.



CERTIFICATION PLATE (1)



IDENTIFICATION PLATE (2)



INSTRUCTION (LOAD) PLATE (3)

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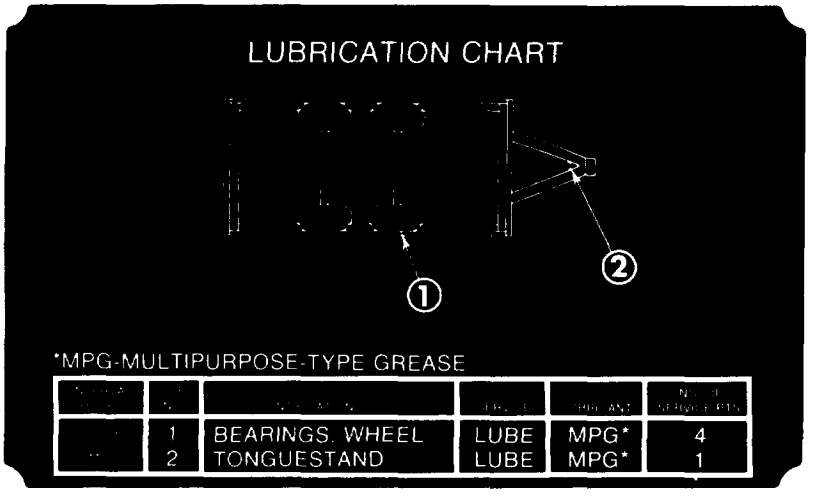
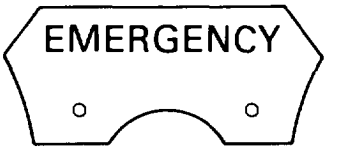
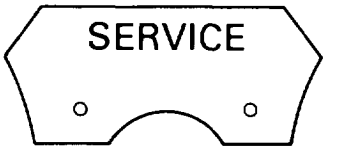
1-14. DATA PLATES (cont)



LUBRICATION PLATE (4)



AIR EMERGENCY PLATE (5)



AIR SERVICE

WARRANTY STATEMENT

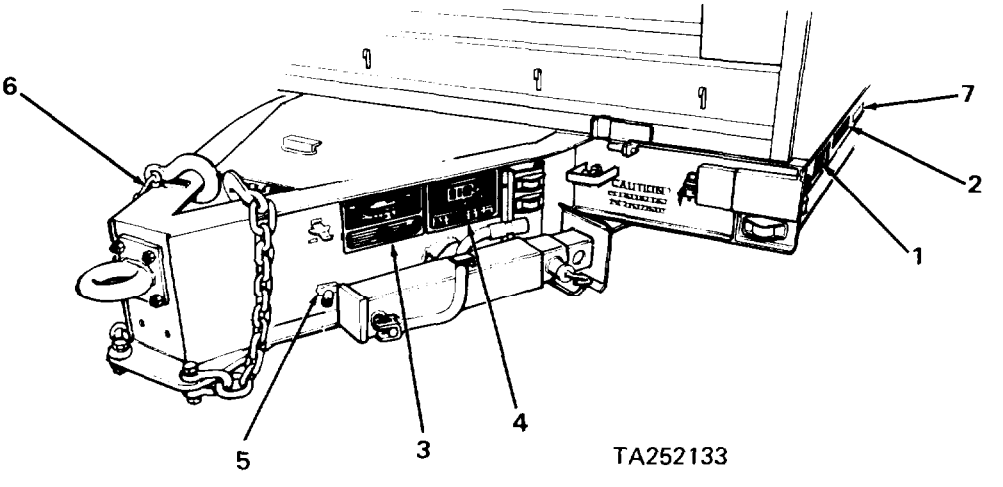
THIS VEHICLE IS UNDER PARTS ONLY WARRANTY FOR (12)-TWELVE MONTHS (PLUS 6-MONTHS DEPOT STORAGE, IF APPLICABLE) FROM ACCEPTANCE DATE REGARDING DEFECTS IN MATERIAL AND WORKMANSHIP.

REPLACEMENTS FOR DEFECTIVE PARTS WILL BE SUPPLIED WITHOUT COST F.O.B. PLANT OR CONUS DESTINATION. DEFECTIVE PARTS SHALL BE RETURNED TO THE MANUFACTURER. **IF REQUESTED**. THIS WARRANTY DOES NOT COVER LABOR TO REMOVE AND INSTALL SAID PARTS. THE CONTRACTOR REQUIRES NOTICE OF WARRANTY CLAIM PRIOR TO CORRECTION.

IDENTIFY TRAILER BY BETA MFR.CO. VEHICLE IDENTIFICATION NUMBER (VIN) FOUND ON TRAILER DATA PLATE.

CONTACT: BETA MANUFACTURING COMPANY (414) 744-1134

WARRANTY DECAL (7)



CHAPTER 2

OPERATING INSTRUCTIONS

Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS & INDICATORS

	Page
Lighting System	...2-1
Air Brake System	...2-2
Coupler and Safety Chains	...2-3
Spare Tire Carrier	...24
Landing Gear	...24
Storage Box,	2-5
Fire Extinguisher	...2-5
SPLL Adapter	...2-5
Lifting Eyes	...2-6
Gates	...2-6

I 2-1. LIGHTING SYSTEM I

a. Lights. The HEMAT lights are operated by the towing vehicle through the intervehicular cable. Lights include the following:

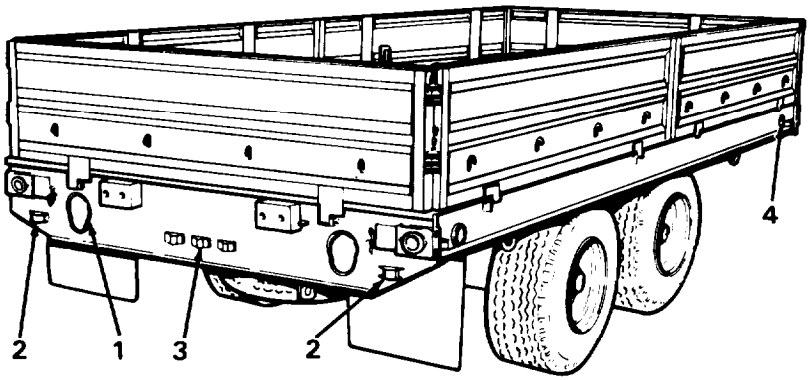
(1) Two rear composite lights (1), each containing a stoplight, turn-signal light, a blackout stoplight, and blackout marker light.

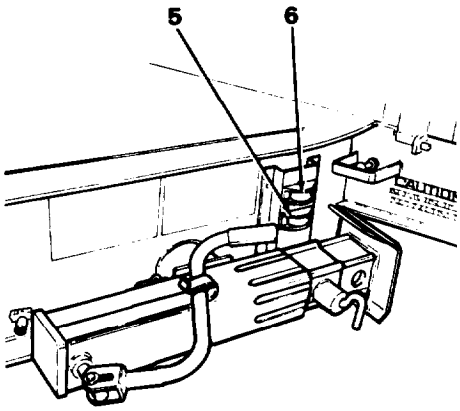
(2) Four red clearance marker lights (2), one on each side rearward and one on each corner of rear.

(3) Three rear red marker lights (3).

(4) Four amber clearance marker lights (4), one on each side forward and one on each side of front corner, and two amber clearance marker lights (5) one on each side of tongue.

(5) Two blackout amber clearance marker lights (6) one on each side of tongue.





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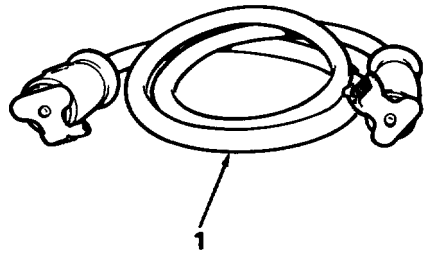
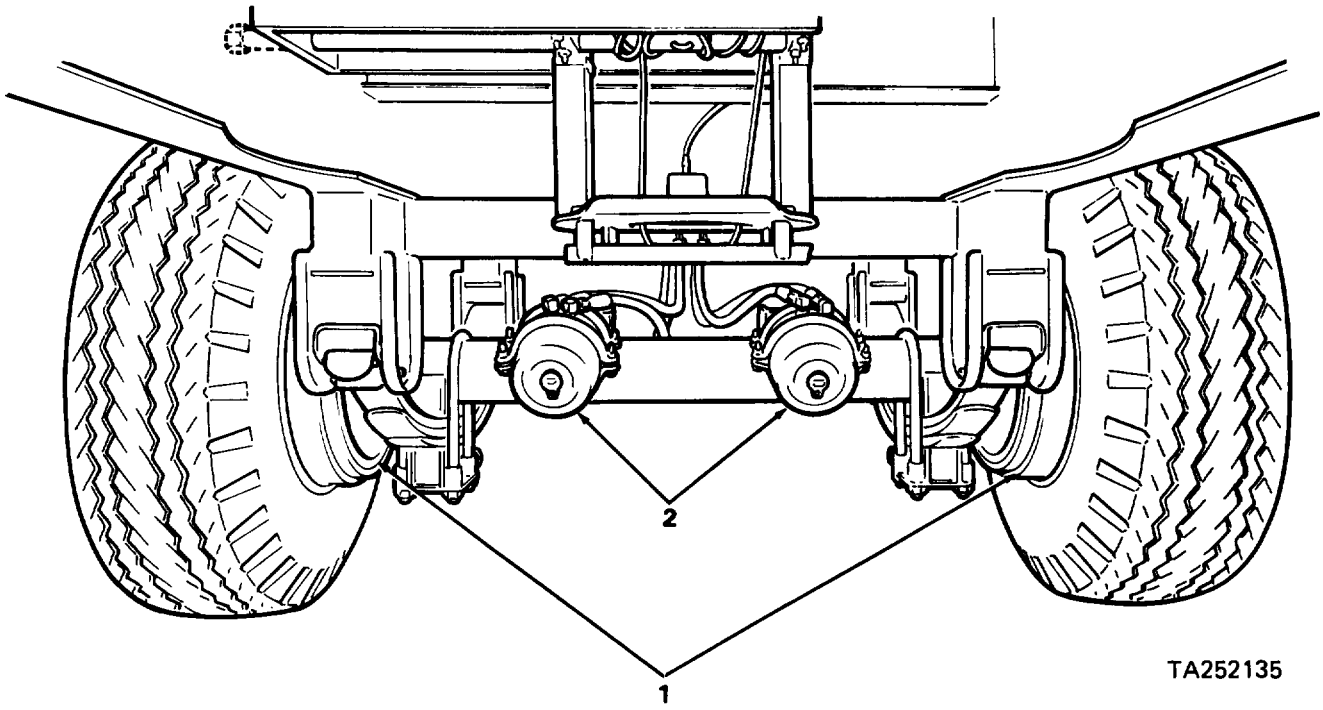
2-1. LIGHTING SYSTEM (cont)



b. InterVehicular Cable. The intervehicular cable (1) is used to connect the HEMAT lighting system to the towing vehicle electrical system during towing operations. The cable plugs are keyed so they can be connected to the HEMAT and towing vehicle receptacles in only one way. The lights are operated from the towing vehicle. The cable is stowed in the storage box when not in use.

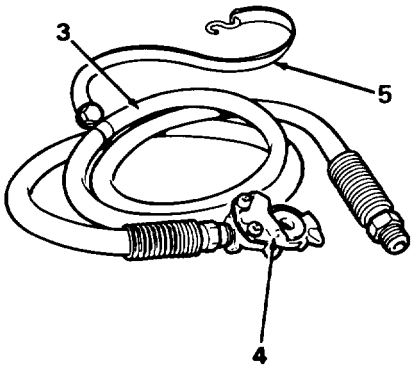
2-2. AIR BRAKE SYSTEM

a. Service Brakes. The service brakes (1) are expanding-shoe on drum type with dust shields on inside of brake housings. The brake shoes are actuated by individual air chambers (2) through camshafts. The air chambers are connected to the air system valves and tanks through hoses. The service brakes are normally locked as parking brakes when the HEMAT is disconnected from the towing vehicle. Refer to paragraph 2-2c for operation of the trailer parking brake control.



2-2. AIR BRAKE SYSTEM (cont)

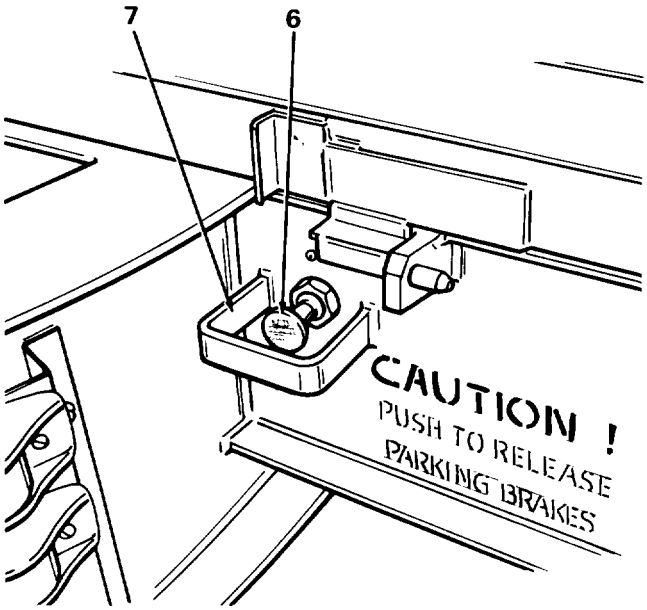
b. Intervehicular Air Hoses. Air for operation of the HEMAT brakes is provided from the towing vehicle through intervehicular air hoses (3). One hose is for service brake operation; the other hose is for emergency operation. Both hoses have gladhand couplings (4) for quick secure connection to the towing vehicle. Rubber straps (5) are provided to connect the air hoses to the tongue and prevent dragging.



WARNING

Do not actuate the trailer parking brake control unless the HEMAT is on level terrain. Without brakes the HEMAT may roll and move out of control causing possible injury or damage.

c. Trailer Parking Brake Control. Pushing in the brake control knob (6) permits the crew to unlock the HE MAT brakes when the HE MAT is disconnected from the towing vehicle. If there is not enough air in the HE MAT air tanks, the knob will pop out to the normal position and the parking brakes will remain locked. A guard (7) prevents accidental valve actuation.



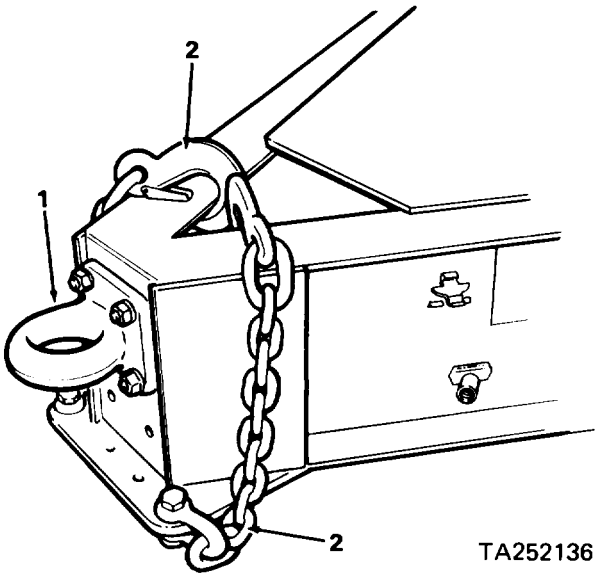
NOTE

The HEMAT brakes can also be released mechanically by caging the brake chamber springs (para. 2-27).

2-3. COUPLER AND SAFETY CHAINS

a. Coupler (1). The coupler is a lunette type used to connect the HEMAT to the towing vehicle pintle during transporting. The coupler is bolted to the trailer frame. Height can be adjusted by remounting the coupler in a series of holes in the trailer tongue. The coupler should be mounted in the position that will cause the HEMAT to ride closest to level.

b. Safety Chains (2). Two safety chains are provided on the forward end of the frame. Their purpose is to prevent a breakaway if the pintle-coupler connections should fail. The safety chains are connected to towing vehicle after the coupler is connected to towing pintle. The chains are hooked around the trailer tongue when not in use.



2-4 SPARE TIRE CARRIER

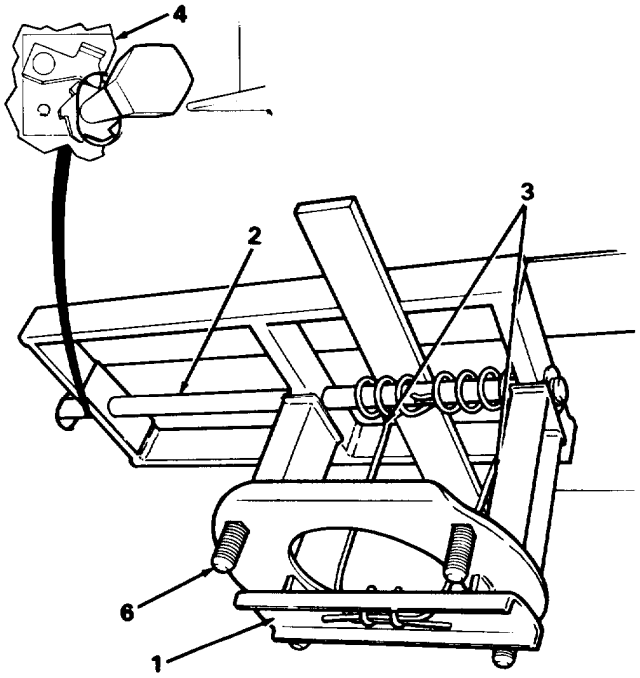
The spare tire carrier holds the spare tire under the trailer frame and permits lowering or raising the spare tire.

a. The spare tire is supported by a pickup tire plate (1) which is connected to the carrier shaft (2) by cables (3). As the shaft turns the cables wind or unwind to raise or lower the spare tire.

WARNING

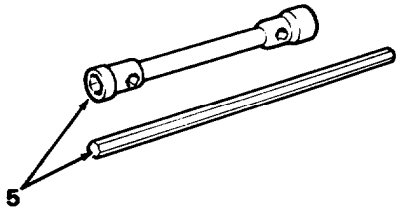
Spare tire will drop to the ground as soon as ratchet is released. Stand clear to prevent possible injury.

b. A ratchet and pawl (4) prevents slippage when raising the spare tire. To lower the spare tire, the ratchet (4) is manually released; the shaft turns counterclockwise. To raise the spare tire, the carrier shaft is turned clockwise using the tire lug wrench (5). Once the spare is raised, it is secured to four fixed studs (6) with wheel nuts.



NOTE

Whenever the spare tire is dropped, inspect cables (3) for fraying, corrosion and other defects.



2-5. LANDING GEAR

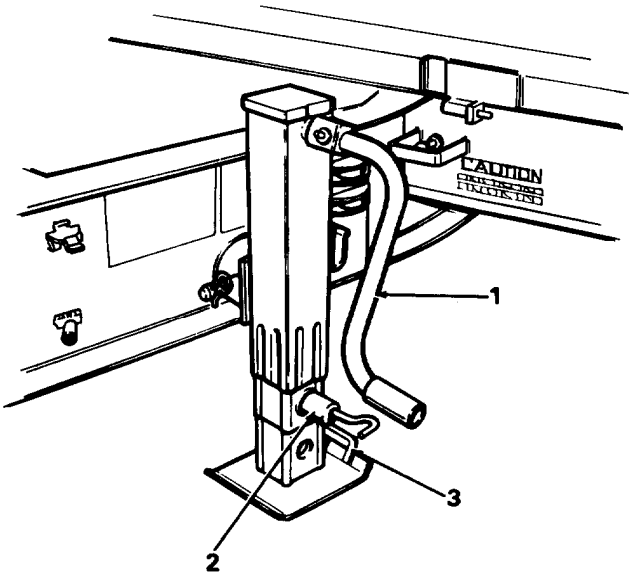
The landing gear is used to support the front end of the HEMAT when uncoupled. It can be used during the loading or unloading of the trailer. The landing gear is placed in the vertical position for use and the horizontal position for storage.

a. Crank (1). Operates the landing gear. Crank is bolted to gear shaft and can be swung around for storage.

WARNING

Do not attempt to pull plunger unless trailer is connected to towing vehicle pintle if trailer is loaded. The load may cause the trailer to tip forward and cause injury.

b. Plunger (2). When pulled with no load on landing gear allows shoe (3) to free fall to ground with no load on landing gear. Plunger is spring loaded.



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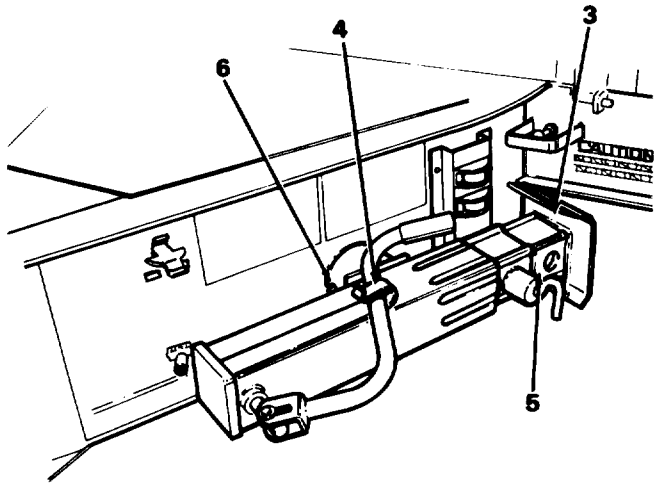
2-5. LANDING GEAR (cont)

c. Crank Stow Bracket (4). Stows the crank when the crank is not in use.

d. Leg (5). Supports the weight of the trailer when extended. Slides into housing when retracted.

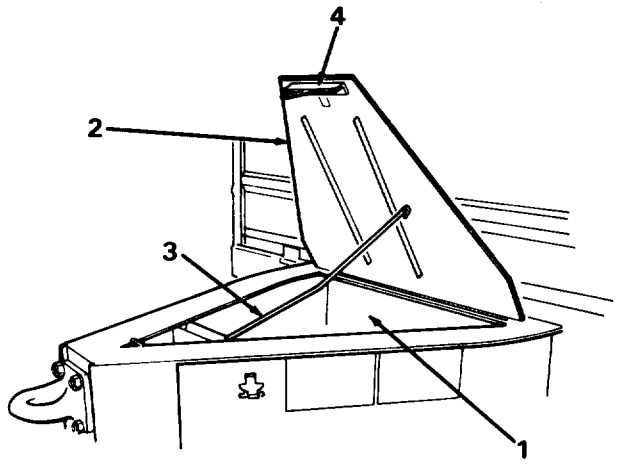
e. Landing Gear Shoe (3). Keeps the legs from sinking into the ground.

f. Hitch Pin Assembly (6). Locks the landing gear in vertical or horizontal position. Removed to turn unit.



I 2-6. STORAGE BOX I

The storage box (l), located in the trailer tongue, is used to stow the intervehicular cable, fire extinguisher, SPLL adapter, lug wrench and other tools. The box is fitted with a heavy gauge, steel cover (2), which is hinged at the rear end. A support strut (3) is provided to hold the cover open when necessary and a latch (4) to permit locking the cover down.

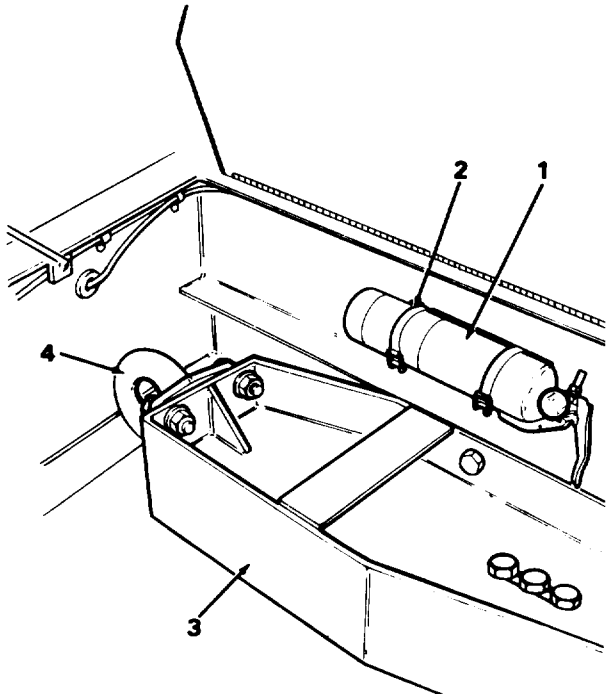


I 2-7. FIRE EXTINGUISHER I

The fire extinguisher (1) is a standard 10BC type. It is mounted in quick release brackets (2) inside the storage box.

2-8. SPLL ADAPTER

The Self Propelled Loader Launcher (SPLL) adapter (3) is used only when the HEMAT must be connected for emergency SPLL operation. The adapter extends the towing lunette coupler (4) to allow additional trailer-vehicle clearance.



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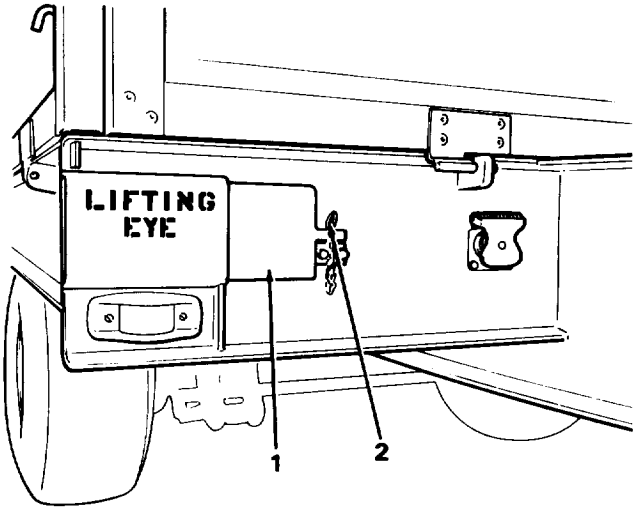
2-9. LIFTING EYES

The lifting eyes (1) provide lift points to lift the unloaded HEMAT if necessary. A pin and chain (2) holds each of the four lifting eyes in the retracted position. The pins are pulled and the lifting eyes pushed out for use.



2-10. GATES

a. The gates are used to retain the cargo within the floor area of the HEMAT, Six gates are provided as follows:

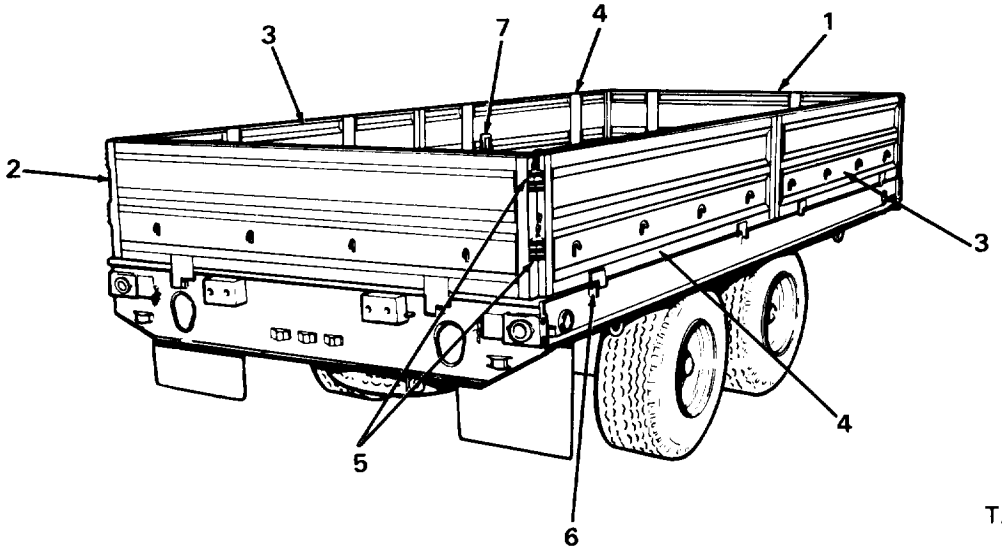
(1) One front gate (1).

(2) One rear gate (2).

(3) One left hand rear gate (3) and one right hand front gate which are the same.

(4) One left hand front gate (4) and one right hand rear gate which are the same.

b. The gates are normally installed at the outside edges of the cargo area in the vertical upright position, but can be swung down to clear the cargo area if necessary. In the upright position, each gate is attached to the adjacent two by pin type latch locks (5). The latch pins are fastened to heavy aircraft wires which are secured to the gates. The lower edge of each gate is hinged by two pins and ear type fasteners (6). The right hand rear gate and left hand front gate are also secured to the trailer frame by vertical slide bolts (7) which enter pockets in the frame.



Section II. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

Page
Maintenance Forms and Records 2-7
Operator/Crew Preventive Maintenance
Checks and Services 2-7

I 2-11. MAINTENANCE FORMS AND RECORDS I

Every mission begins and ends with the paperwork. There isn't much of it, but you have to keep it up. The forms and record you fill out have several uses. They are a permanent record of the services, repairs and modifications made on your vehicle. They are reports to organizational maintenance and to your Commander. And they are a checklist for you when you want to know what is wrong with the vehicle after its last use, and whether those faults have been fixed. For the information you need on forms and records, see DA Pam 738-750.

2-12. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

a. Do your before (B) PREVENTIVE MAINTENANCE just before you operate the vehicle. Pay attention to the CAUTIONS and WARNINGS.

b. Do your (D) PREVENTIVE MAINTENANCE during operation. (During operation means to monitor the vehicles and its related components while they are actually being operated).

c. Do your after (A) PREVENTIVE MAINTENANCE right after operating the vehicle. Pay attention to the CAUTIONS and WARNINGS.

d. Do your (W) PREVENTIVE MAINTENANCE weekly.

e. If something doesn't work, troubleshoot it with the instructions in this manual and notify your supervisor.

f. Always do your PREVENTIVE MAINTENANCE in the same order so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.

g. If anything looks wrong and you can't fix it, write it on your DA Form 2404. If you find something seriously wrong, report it to organizational maintenance RIGHT NOW.

h. When you do your PREVENTIVE MAINTENANCE, take along the tools you need to make all the checks. You always need a rag or two.

WARNING

Dry cleaning solvent (P-D-680) used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Flash point of solvent is 138°F (59°C).

(1) Keep it clean: Dirt, grease, oil and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use dry cleaning solvent (P-D-680) on all metal surfaces. Use soap and water when you clean rubber or plastic material.

(2) Bolts, nuts and screws: Check them all for obvious looseness, missing, bent or broken condition. You can't try them all with a tool, of course, but look for chipped paint, bare metal, or rust around bolt heads. If you find one you think is loose, tighten it, or report it to organizational maintenance if you can 't tighten it.

(3) Welds: Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to organizational maintenance.

(4) Electric wires and connectors: Look for cracked or broken insulation, bare wires and loose or broken connectors. Tighten loose connectors and make sure the wires are in good shape.

(5) Air hose lines: Look for wear, damage and leaks, and make sure clamps and fittings are tight. If a leak comes from a loose fitting or connector, tighten it. If something is broken or worn out, report it to organizational maintenance.

Table 2-1. Operator/Crew Preventive Maintenance Checks and Services

NOTE
Within designated interval, these checks are to be performed in the order listed.

B – Before **D – During** **A – After** **W – Weekly**

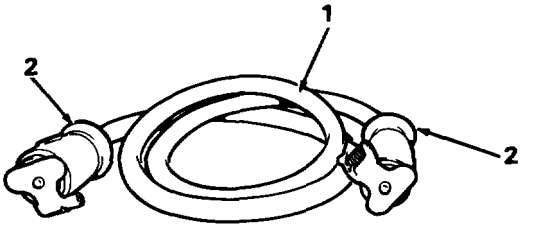
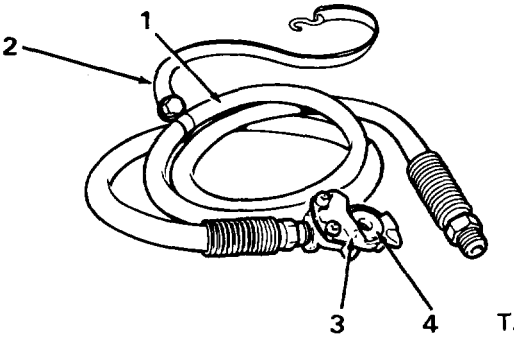
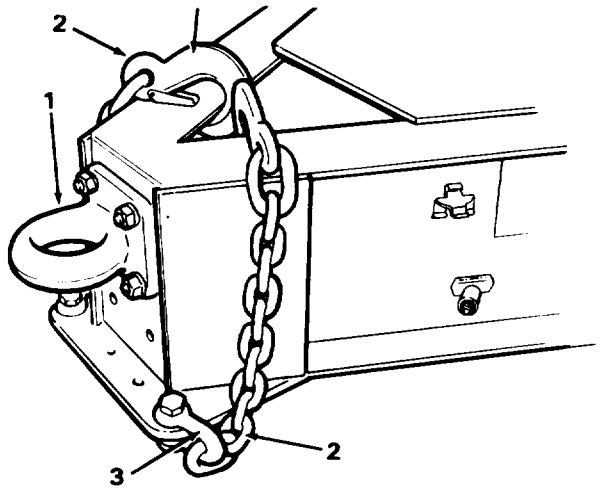
Item No.	Interval B	D	A	W	ITEM TO BE INSPECTED Procedure: Check For and Have Repaired, Filled, or Adjusted as Needed.	Equipment Will Be Reported Not Ready/ Available If
					NOTE Perform weekly as well as before PMCS if: a. You are the assigned operator but have not operated vehicle since the last weekly. b. You are operating the vehicle for the first time.	
1	•				INTERVEHICULAR CABLE Check intervehicular cable (1) for cuts, breaks, and frayed wires or damaged cable plugs (2). Replace if defective.  	
2					INTERVEHICULAR AIR HOSES	
	•				a. Check intervehicular air hoses (1) and straps (2) for cuts, breaks, and damaged gladhand (3). If damaged, notify organizational maintenance.	
	•				b. Check packing (4). Replace if defective.  	

Table 2-1. Operator/Crew Preventive Maintenance Checks and Services (cont)

NOTE
Within designated interval, these checks are to be performed in the order listed.

B – Before **D – During** **A – After** **W – Weekly**

Item No.	Interval B	D	A	W	ITEM TO BE INSPECTED Procedure: Check For and Have Repaired, Filled, or Adjusted as Needed.	Equipment Will Be Reported Not Ready/ Available If:
3	•				COUPLER AND SAFETY CHAINS Check for loose, missing or damaged coupler (1) or safety chains (2) and shackles (3). Notify organizational maintenance of defects.	Coupler and/or safety chain and shackle are missing or damaged.
4		•			LANDING GEAR (1)	
					Check operation for binding, physical damage or missing parts. Notify organizational maintenance of defects.	Landing gear does not operate.



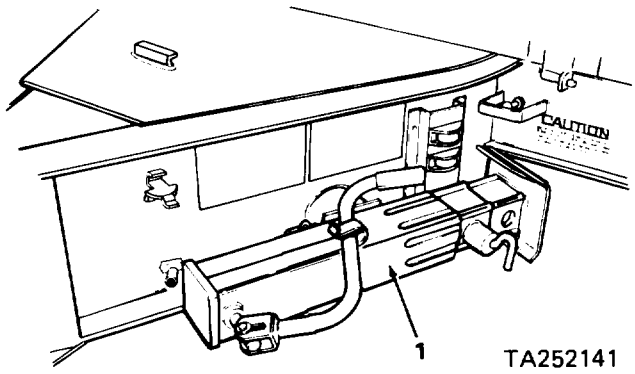


Table 2-1. Operator/Crew Preventive Maintenance Checks and Services (cent)

NOTE
Within designated interval, these checks are to be performed in the order listed.

B – Before **D – During** **A – After** **W – Weekly**

Item No.	Interval B	D	A	W	ITEM TO BE INSPECTED Procedure: Check For and Have Repaired, Filled, or Adjusted as Needed.	Equipment Will Be Reported Not Ready/ Available If:
5				•	TIRES a. Check for tire pressure of 85 PSI (4.07 KPa) when tires (1) are cool.	Two tires are flat, missing or unserviceable.
	•				b. Check tires for cuts, foreign objects or unusual tread wear. Remove any stones from between treads.	
6	•				WHEELS Check wheels (2) for damage and wheel nuts (3) for obvious looseness and presence. **NOTE** Report any loose wheel nuts to organizational maintenance for torquing.	Missing wheel nut.

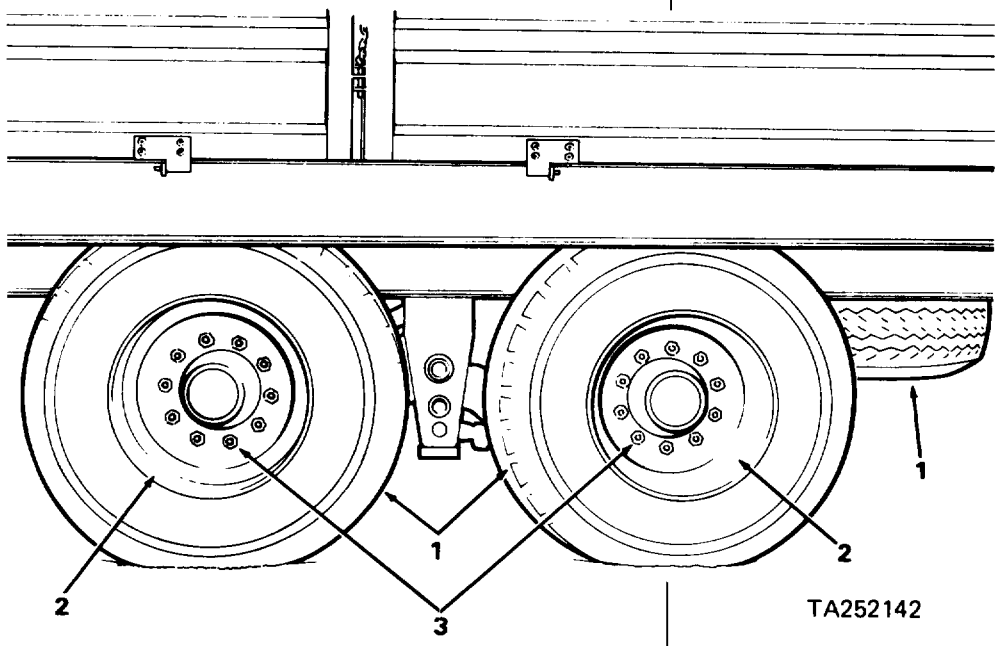
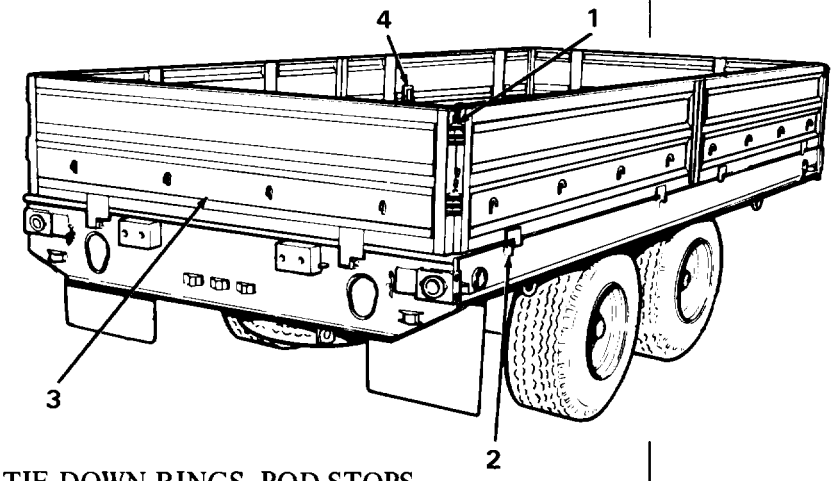


Table 2-1. Operator/Crew Preventive Maintenance Checks and Services (cent)

NOTE
Within designated interval, these checks are to be performed in the order listed.

B – Before **D – During** **A – After** **W – Weekly**

Item No.	Interval B	D	A	W	ITEM TO BE INSPECTED Procedure: Check For and Have Repaired, Filled, or Adjusted as Needed.	Equipment Will Be Reported Not Ready/ Available If:
7				•	GATES Inspect gates for damaged latch pins (1), hinges (2), panels (3) and slide bolts (4). Replace defective gates.	
8					TIE DOWN RINGS, POD STOPS AND FLOOR BOARDS	
	•				a. Inspect for damaged or missing tie down rings (1).	Missing tie down ring.
	•				b. Inspect for loose, missing or damaged pod stops (2).	Missing or loose pod stops when required for mission.
	•				c. Inspect for loose, damaged or warped floor boards (3). Notify Organizational Maintenance.	Damaged or warped floor boards.



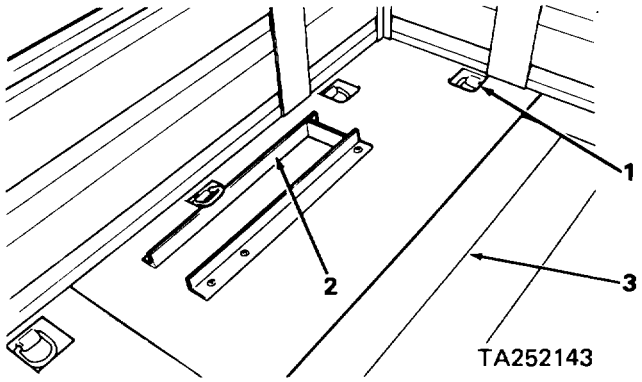


Table 2-1. Operator/Crew Preventive Maintenance Checks and Services (cont)

NOTE
Within designated interval, these checks are to be performed in the order listed.

B – Before **D – During** **A – After** **W – Weekly**

Item No.	Interval B	Interval D	Interval A	Interval W	ITEM TO BE INSPECTED Procedure: Check For and Have Repaired, Filled, or Adjusted as Needed	Equipment Will Be Reported Not Ready/ Available If:
9					LIGHTS AND REFLECTORS	
		•			a. Check all lights for proper operation.	
					NOTE An assistant is required while checking the brake lights with vehicle connected to prime mover.	
				•	b. Check for damaged or missing reflectors.	
10					AIR TANKS	
			•		a. Inspect both tanks (1) for damage and leakage.	Air leakage.
					WARNING Keep away from drain cocks when draining air tanks to prevent injury to eyes by compressed air.	
			•		b. Open drain cocks (2) on air tanks to drain condensation.	
			•		c. Close drain cocks.	

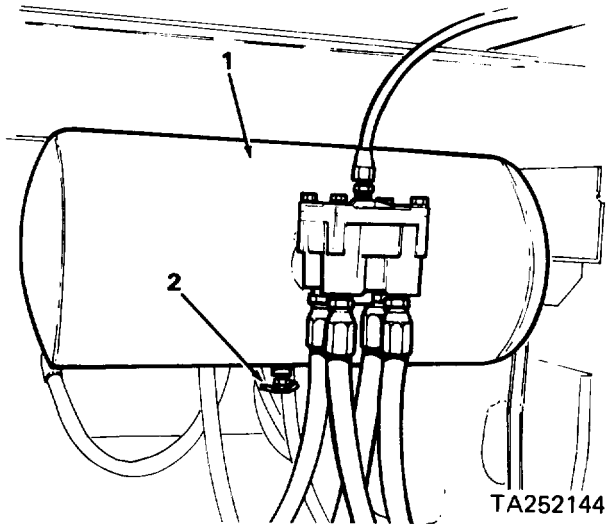


Table 2-1. Operator/Crew Preventive Maintenance Checks and Services cont)

NOTE
Within designated interval, these checks are to be performed in the order listed.

B – Before D – During A – After W – Weekly

Item No.	Interval B	D	A	W	ITEM TO BE INSPECTED Procedure: Check For and Have Repaired, filled, or Adjusted as Needed	Equipment Will Be Reported Not Ready/ Available If:
11					AIR BRAKE SYSTEM	
	•				a. Inspect air valves, tanks and lines for loose connections and damage. Report deficiencies to organizational maintenance.	Damaged components.
		•			b. Test air brake system.	
					(1) Connect HEMAT to towing vehicle (para. 2-13).	
					(2) Actuate service brakes. Observe brake shoes and air chambers to make sure brakes are evenly applied.	Uneven or no braking.
					(3) Disconnect HEMAT from towing vehicle (para. 2-16).	
					(4) Check if brakes are locked.	
					WARNING Do not actuate trailer parking brake control unless the HEMAT is on level terrain. Without brakes the HEMAT may roll and move out of control causing possible injury or damage.	
					(5) Push in parking brake control and observe that brakes release.	Trailer parking brake control non-operational.
					(6) Pull out parking brake control valve to lock brakes.	
					(7) Report any deficiencies to organizational maintenance.	
12			•		U-BOLTS After initial run-in, notify organizational maintenance to torque U-bolt nuts.	Nuts loose.
13	•				FRAME Inspect frame for obvious broken welds and distortion. Report damage to organizational maintenance.	Broken welds and/or distortion.

Section III. OPERATION UNDER USUAL CONDITIONS

	Page
Connecting HEMAT to Towing Vehicle	2-14
Gate Installation	2-18
Operation	2-19
Disconnecting HEMAT from Towing Vehicle	2-21
Gate Removal	2-23
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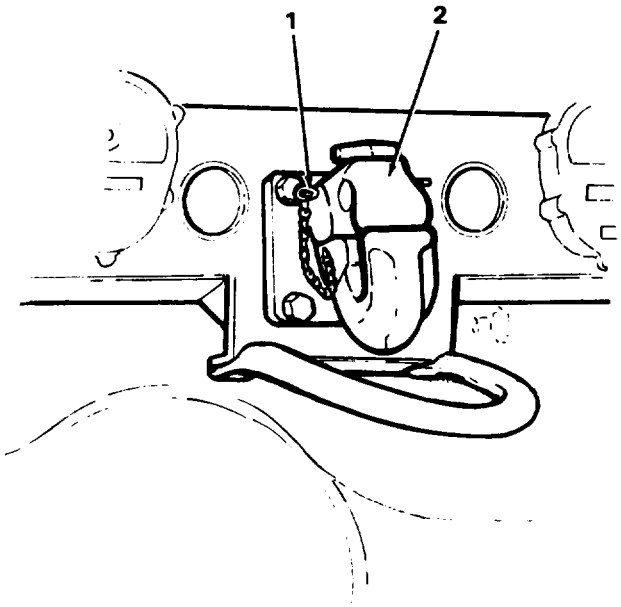
2-13. CONNECTING HEMAT TO TOWING VEHICLE

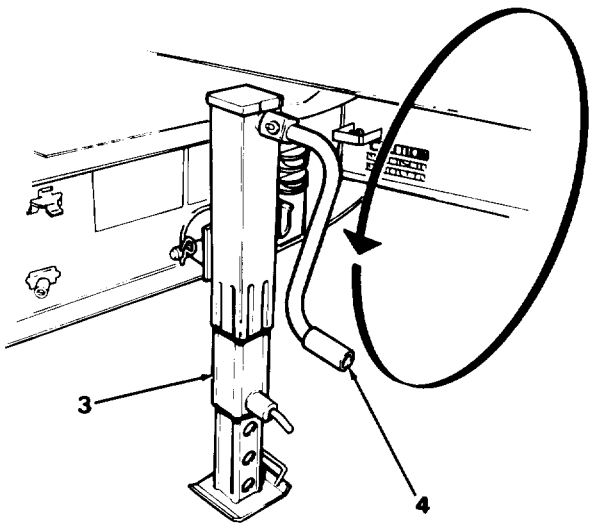
WARNING

Do not stand between towing vehicle and HEMAT when backing towing vehicle. Serious injury can result if personnel are caught between the vehicles.

a. On towing vehicle, pull cotter pin (1) and open pintle (2). Back towing vehicle up until coupler is centered in towing vehicle pintle.



b. Raise landing gear leg (3) using crank (4) until towing vehicle is supporting weight of trailer.



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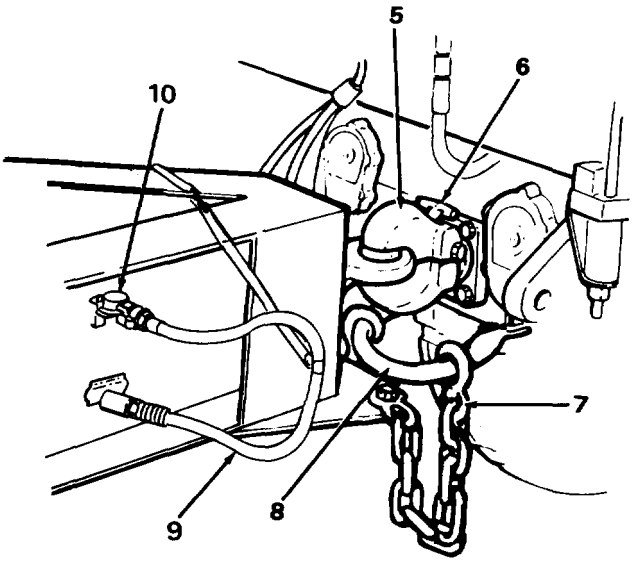
2-13. CONNECTING HEMAT TO TOWING VEHICLE (cont)

c. Close towing vehicle pintle (5) ensuring lock (6) is down in place, and install cotter pin to lock pintle.

d. Attach safety chains (7) to towing vehicle ring (8).



e. Connect intervehicular air hoses (9) to towing vehicle as follows:

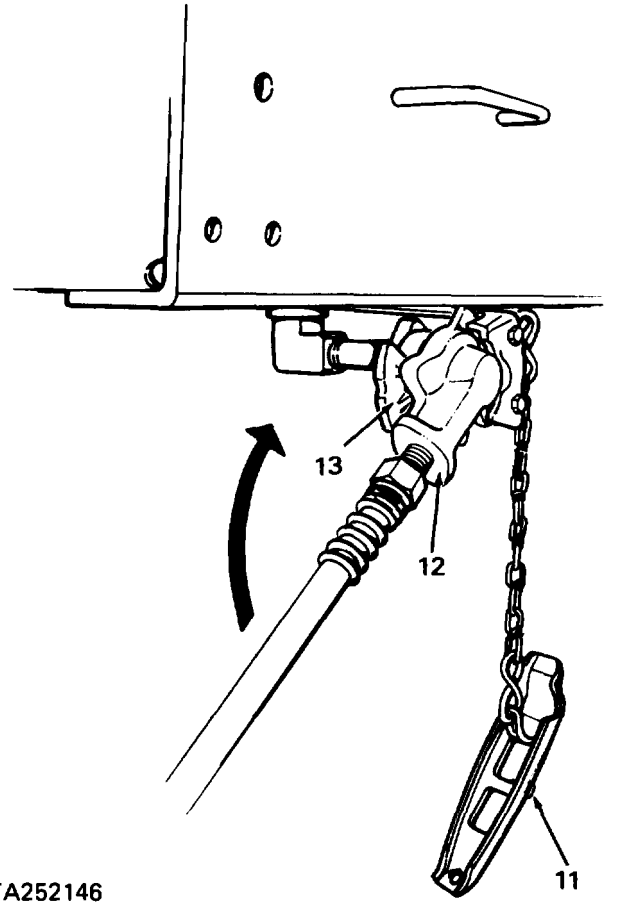
NOTE
Ensure service and emergency intervehicular air hoses are connected service to service and emergency to emergency on towing vehicle.

(1) Remove intervehicular air hoses (9) from gladhand dummy coupler (10) on trailer tongue.

(2) Remove dummy couplings (II).

(3) Hold hose glandhand couplings (12) against the towing vehicle gladhand couplings (13) at a 90° angle and rotate until locked in place.

NOTE
Be sure air hose strap is connected to tongue.



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2-13. CONNECTING HEMAT TO TOWING VEHICLE (cont)

f. Connect the HEMAT lighting system to the electrical system of the towing vehicle as follows:

(1) Remove intervehicular cable (14) from storage box.

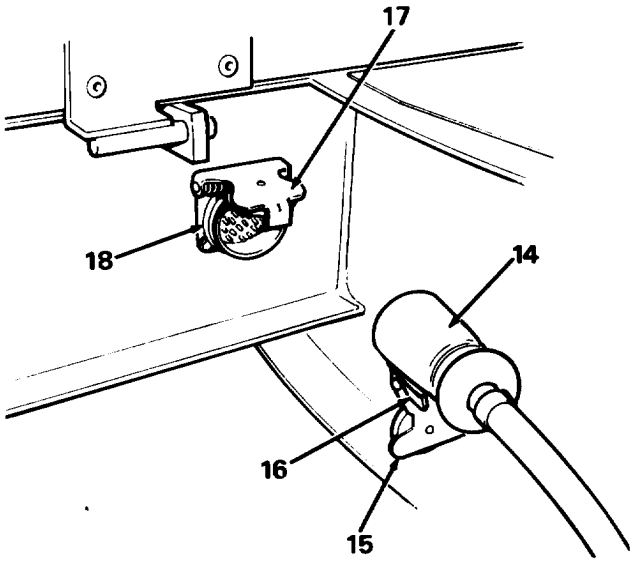
(2) Open protective covers (1 5) of intervehicular cable. Lock each cover of intervehicular cable by sliding latch lock (16) in place.

(3) Lift receptacle cover (17) on trailer.

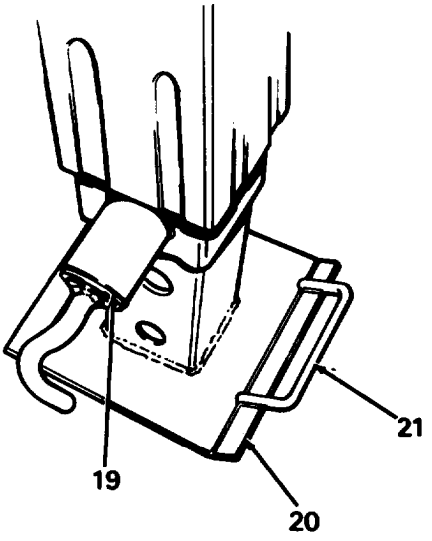
NOTE
Check receptacle for bent or broken pins.

(4) Plug intervehicular cable into receptacle (18). Cable plugs are keyed **so** connection can be made only one way.

(5) Connect opposite end of cable to towing vehicle in the same way (steps (3) and (4)).



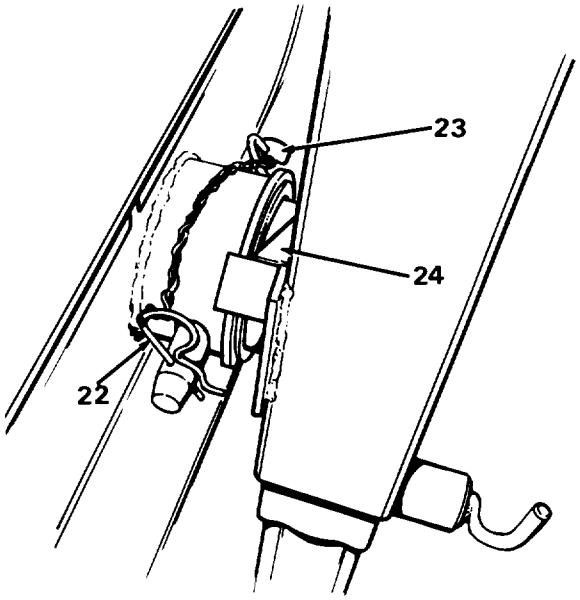
g. Pull plunger (19) out and raise shoe (20) using handle (2 I) until second lowest hole in shoe engages plunger detent.



TA252147

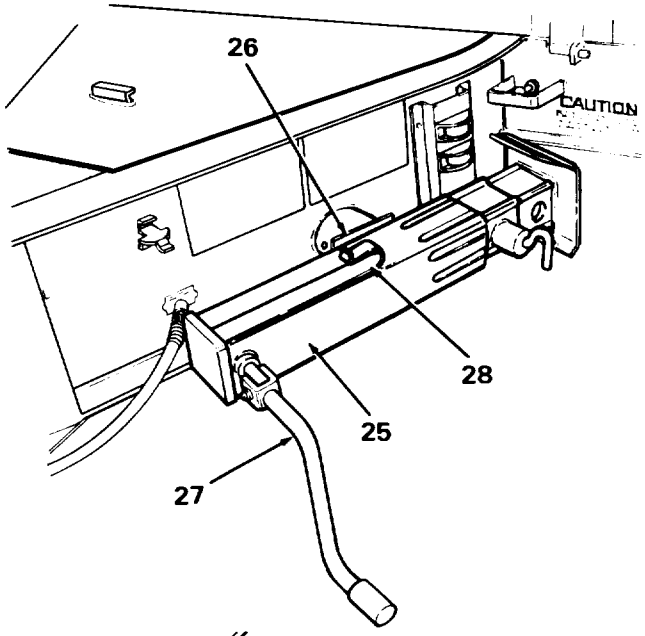
2-13. CONNECTING HEMAT TO TOWING VEHICLE (cont)

h. Crank landing gear leg up, using crank, until leg is fully retracted. Pull clip pin (22) and withdraw hitch pin (23) from flange (24).

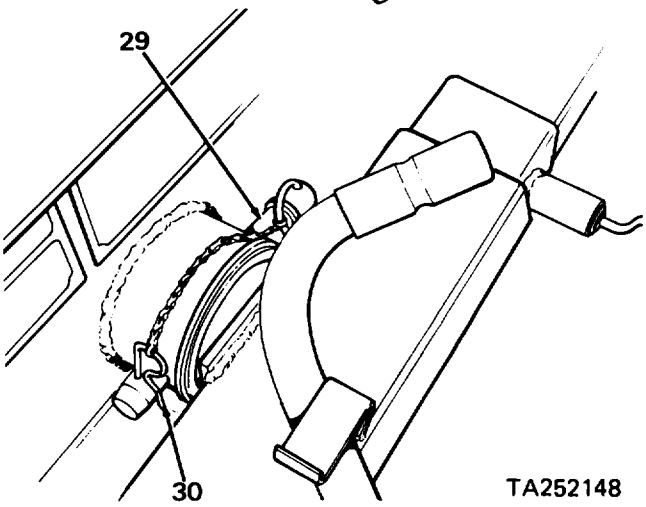


i. Turn landing gear (25) to horizontal position so holes (26) in landing gear flange and frame flange are aligned.

J Pull crank (27) to disengage from landing gear shaft and stow crank in bracket (28).



k. Install hitch pin (29) in landing gear flange and install clip pin (30),



2-14. GATE INSTALLATION

To install gates, proceed as follows:

a. Using an assistant, hold left hand front gate rack horizontally and place next to left hand side of trailer forward.

b. Position gate so both hinge pins (1) are alined with ears (2) on trailer frame.

c. Move gate to engage hinge pins with holes in ears. Lift gate slightly to clear hinge stops if necessary.

d. Lift up left hand front gate (3) to vertical.

e. Engage slide bolt (4) on gate with pocket in frame to secure.

f. Install left hand rear gate (steps a through d).

g. Lift up left hand rear gate to vertical so holes in latch eyes (5) are aligned. Install latch pins (6) in latch eyes to secure.

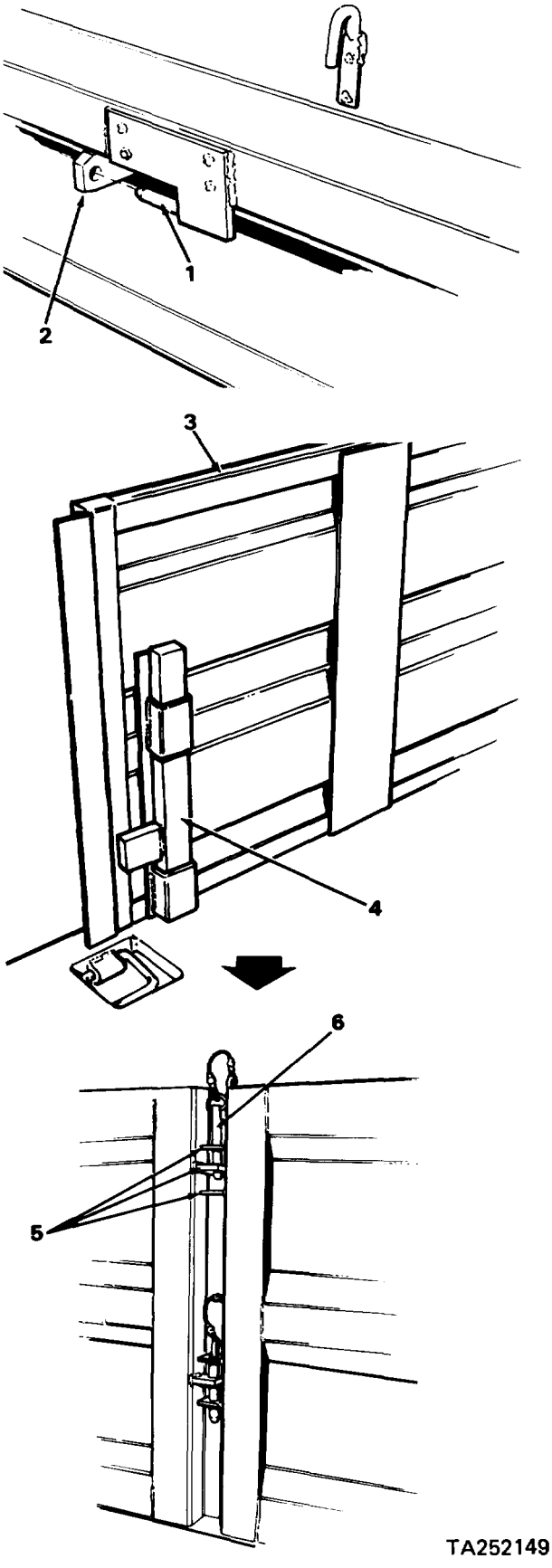
h. Install right hand rear gate in same manner as left hand front gate (steps a through e).

i. Install right hand front gate in same manner as left hand rear gate (steps a through d and g).

j. Install front gate and rear gate in same manner as left hand rear gate (steps a through d and g).

NOTE

Gates can be lowered to permit better access and easier loading. Left hand front gate cannot be lowered unless left hand rear gate is lowered first. The same is true of the right hand rear gate.



TA252149

2-15. OPERATION

a. Loading HEMAT.

(1) Load cargo into HEMAT to distribute load weight as evenly as possible lengthwise and sidewise.

(2) Secure load using tie down rings (1) which are located along edge of frame. Twenty-six tie down rings are provided.

(3) If MLRS pods will be loaded on HEMAT, attach pod stops (2) to anchor plates in each corner of floor.

NOTE

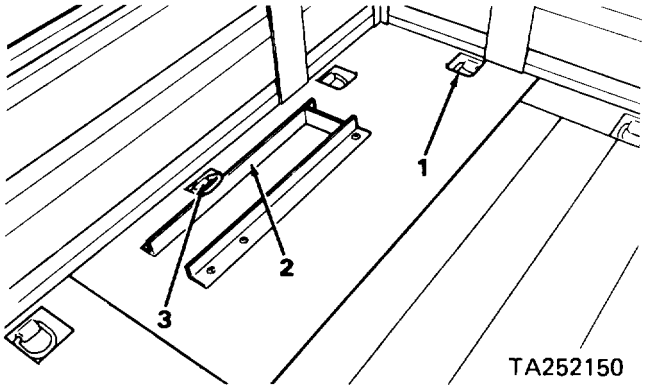
Tie down ring (3) next to pod stop must be above edge of pod stop.

b. Towing HEMAT.

(1) Driving. When driving the towing vehicle with HEMAT, the overall length of the unit must be kept in mind when passing other vehicles and when turning. Because the unit is hinged in the middle, turning and backing are also affected. The HEMAT payload will affect stopping and off road maneuverability.

(2) Turning. When turning corners, allow for the fact that the HEMAT wheels turn inside the turning radius of the towing vehicle. To make a right turn at a road intersection, drive the towing vehicle about halfway into the intersection and then cut sharply to the right. This will allow for the shorter turning radius of the HEMAT and will keep it off the curb.

(3) Stopping. In normal operation, the brakes of the towing vehicle and the HEMAT are applied at the same time when the driver steps on the brake pedal. Brake pressure must be applied gradually and smoothly. The HEMAT brakes may be applied separately by using the brake control lever on the towing vehicle. On steep down grades or slippery surfaces, the HEMAT brakes must be applied before the vehicle



brakes. This will reduce the possibility of jackknifing.

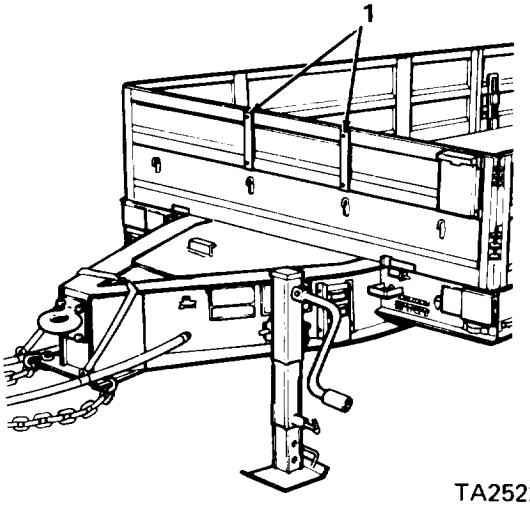
4. Parking. When the towing vehicle and HEMAT are to be parked and left unattended, set the parking brake on the vehicle and apply the brakes on the HEMAT.

WARNING

Do not stand between towing vehicle and HEMAT when backing towing vehicle. Serious injury can result if personnel are caught between the vehicles.

(5) Jackknife Warning System. To prevent jackknifing when backing the HEMAT is equipped with the following visible indicators:

(a) A 2-inch vertical, black plate(1) mounted to the front gate 34 inches from each corner of the front gate.

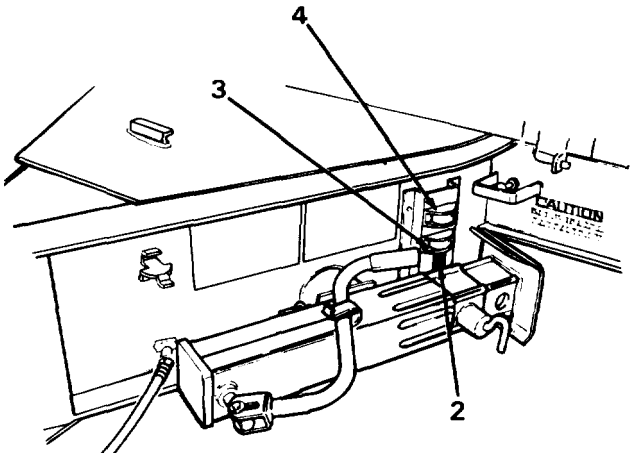


2-15. OPERATION (cont)

(b) A 2-inch black stripe (2) painted on each side of the tongue beam 7-3/4 inches forward of the bed.

(c) An amber clearance marker light (3) mounted on the tongue strip.

(d) A blackout clearance marker light (4) mounted directly above the amber light.



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CAUTION
If the clearance marker lights and/or black stripes become visible during backing, the turn is too sharp and jackknifing is occuring.

(6) Backing. When backing, the rear of the HEMAT will always move in the opposite direction of that in which the front wheels are turned. When the wheels of the towing vehicle are turned to the right, the rear of the HEMAT will go to the left. When the HEMAT has turned and backing in a straight line is required, turn the towing vehicle wheels in the direction that the HEMAT is moving. This will slowly bring the towing vehicle and the HEMAT in a straight line.

CAUTION
Two ground guides are needed to back the HEMAT safely. Avoid backing up HEMTT/HEMAT system if possible. Refer to FM 21-60 for instructions on hand signals.

(a) Adjust rear view mirrors on both sides of HEM MT for best visibility of the trailer and space behind.

(b) Station one ground guide to the right or left rear of the trailer and the other ground guide to the left or right front of the towing vehicle. Front ground guide must be visible to operator at all times to provide backing instructions.

CAUTION
Upon observing jackknife indicators operator must stop HEMTT immediately to prevent damage.

(c) Back up slowly and pay close attention to ground guide's signals.

c. Unloading HEMAT.

(1) Remove any tie downs from the load.

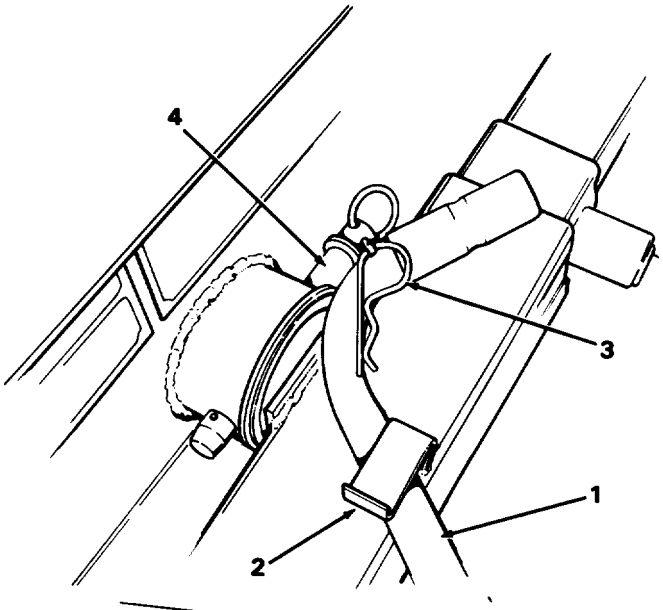
(2) Unload cargo.

(3) Remove pod stops as necessary.

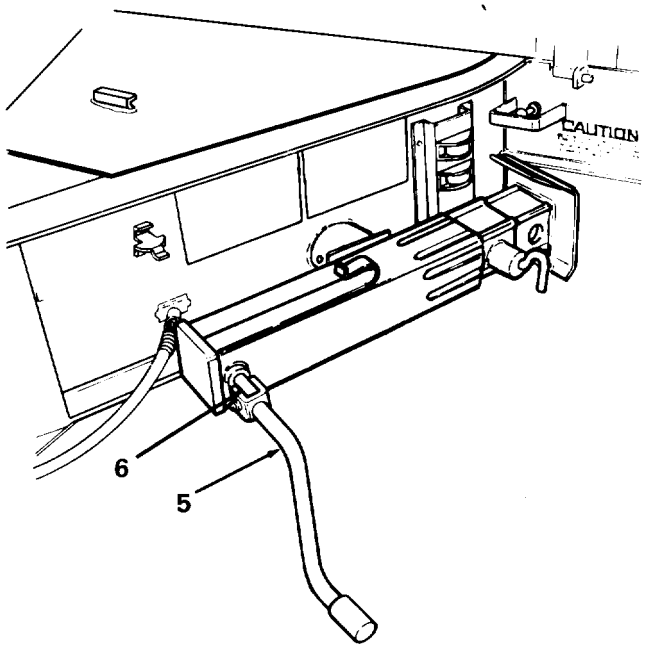
2-16. DISCONNECTING HEMAT FROM TOWING VEHICLE

a. Remove crank (1) from bracket (2).

b. Pull clip pin (3) and withdraw hitch pin (4).

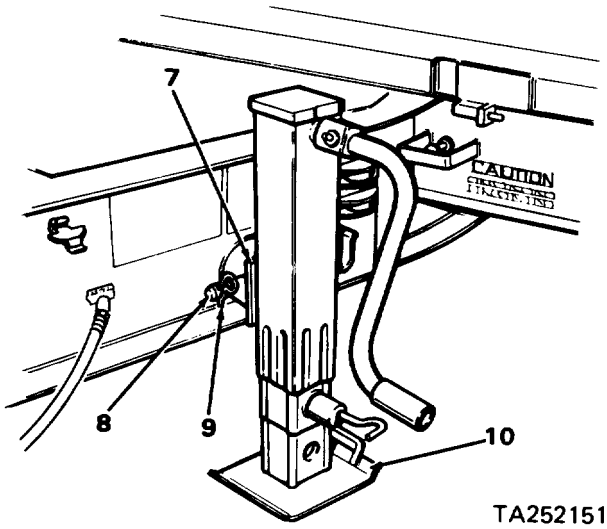


c. Swing crank (5) around so crank is lined with landing gear shaft (6). Push crank in to engage gear shaft.



d. Turn landing gear to vertical position so holes in landing gear and frame flanges (7) are alined. Install hitch pin (8) and clip pin (9).

e. Crank landing gear down until shoe (10) is approximately one foot from ground.



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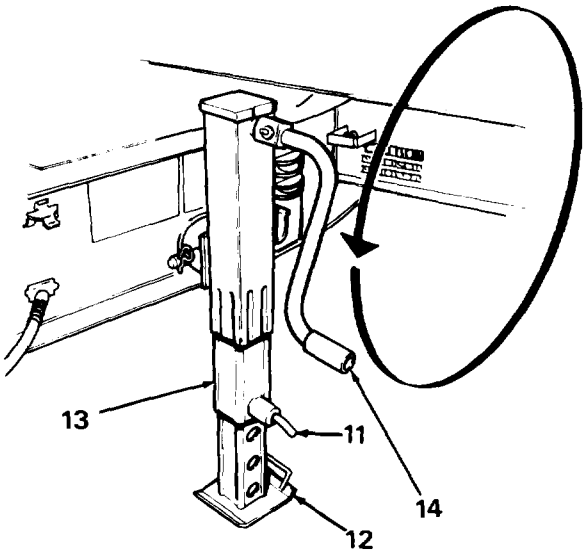
2-16. DISCONNECTING HEMAT FROM TOWING VEHICLE (cont)

f. Pull free-fall plunger (11) so shoe (12) drops to ground.

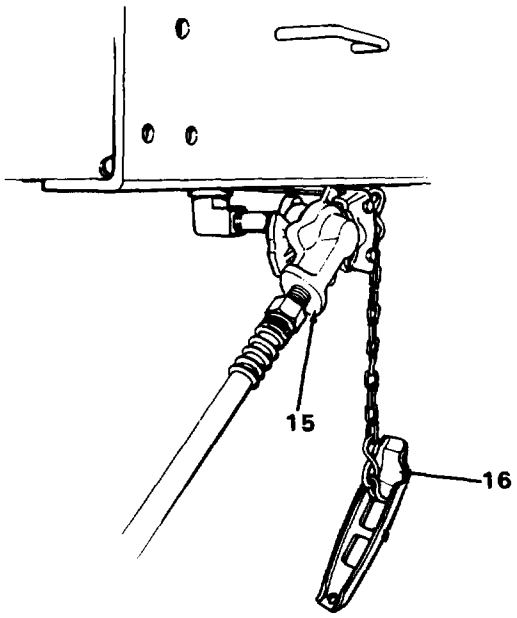
g. Crank landing gear leg (13) down, using crank (14), until coupler (lunette) is centered in towing vehicle pintle and landing gear is supporting weight of HEMAT.



h. Disconnect intervehicular cable and stow in storage box.

i. Disconnect intervehicular air hoses (15) and install dummy coupling (16).

j. Install intervehicular air hoses (15) on gladhand dummy couplings (17).



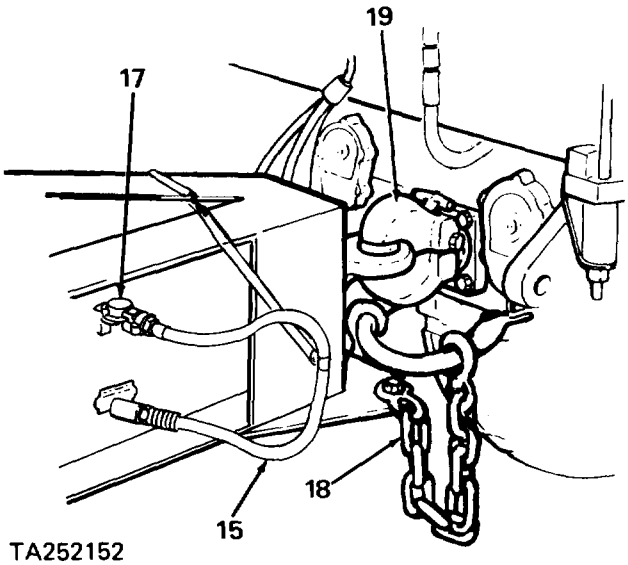
k. Disconnect safety chains (18) from towing vehicle and hook safety chain on the coupler plate.

l. Remove cotter pin from towing vehicle pintle (19). Open towing vehicle pintle.

WARNING

Crank landing gear leg until coupler clears towing pintle to prevent injury to personnel.

m. Drive towing vehicle forward to clear HEM AT.



TA252152

2-17. GATE REMOVAL

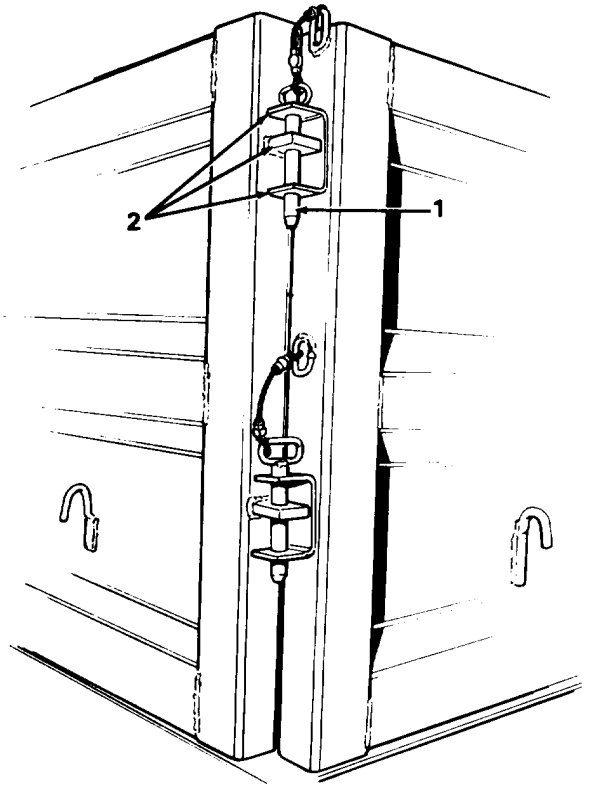
To remove gates an assistant will be required. Proceed as follows:

a. Hold rear gate in raised position and remove latch pins (1) from latch eyes (2). Lower rear gate down to horizontal position.

b. Move rear gate endwise to disengage hinge pins with ears. Remove and stow gate.

c. Lower and remove front gate in same way (steps a and b).

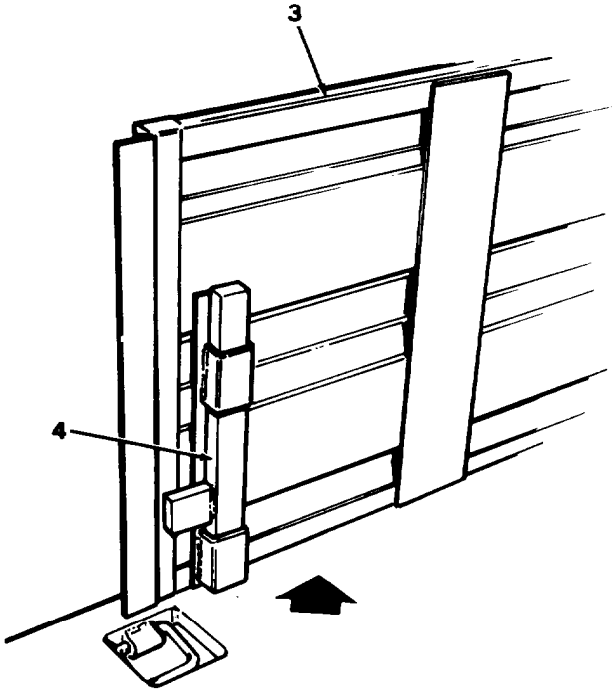
d. Lower and remove right hand front gate and left hand rear gate in same way (steps a and b).



e. Hold right hand rear gate (3) in raised position and remove latch pins from latch eyes. Disengage slide bolt (4) from pocket in frame and lower gate down to horizontal position.

f. Move gate endwise to disengage hinge pins from ears. Remove and stow gate.

g. Lower and remove left hand front gate in same way (steps e and f).



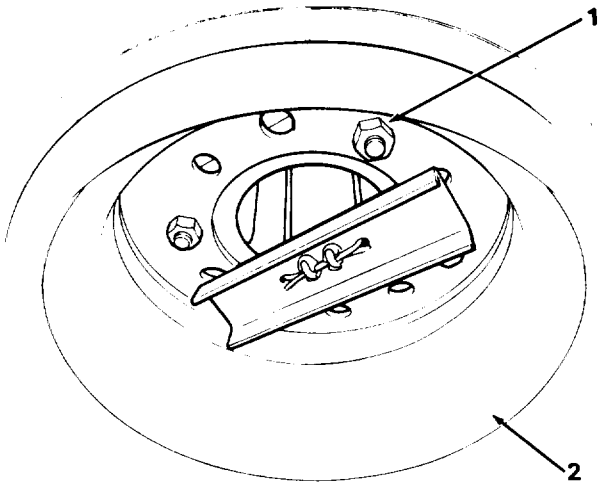
TA252153

2-18. SPARE TIRE CARRIER

a. Removal of Spare Tire.

WARNING

Spare tire and plate will drop to the ground as soon as ratchet is released. Stand clear to prevent possible injury. Spare tire weighs approximately 250 pounds. Use care in handling to prevent injury.

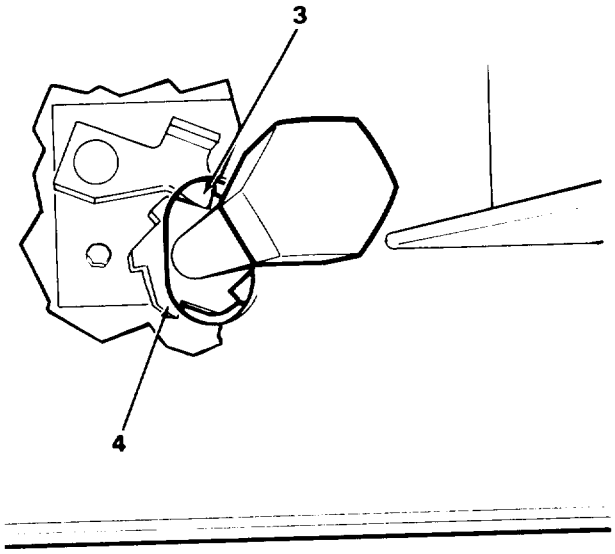


NOTE

Assistance is required for these operations.

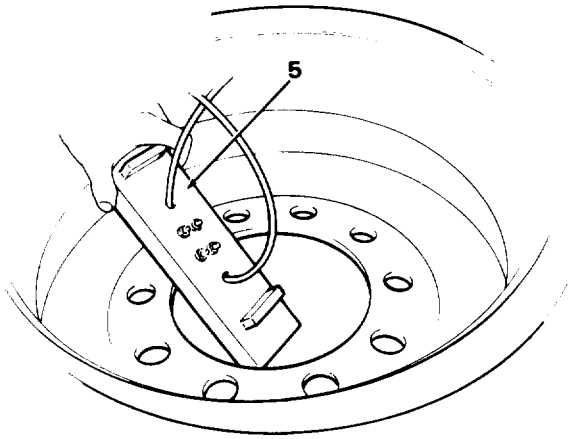
(**1**) Remove four wheel nuts (1) from carrier studs to free spare tire (2).

(2) Release pawl (3) from ratchet (4) on side of carrier using long shaft screwdriver or other suitable tool.



(3) Manipulate tire plate (5) to pass it through wheel rim.

(4) Remove spare tire from under trailer.



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2-18. SPARE TIRE CARRIER (cont)

b. Installation of Spare Tire.

WARNING
Spare tire weighs approximately 250 pounds. Use care in handling to prevent injury.

(1) Inspect cable (1) for fraying, corrosion and looseness. Report defective condition to organizational maintenance.

(2) Place spare tire (2) on ground below tire earner with valve stem down.

(3) Insert tire plate (3) through rim so plate is level.

(4) Check to be sure ratchet (4) and paw] (5) are engaged.

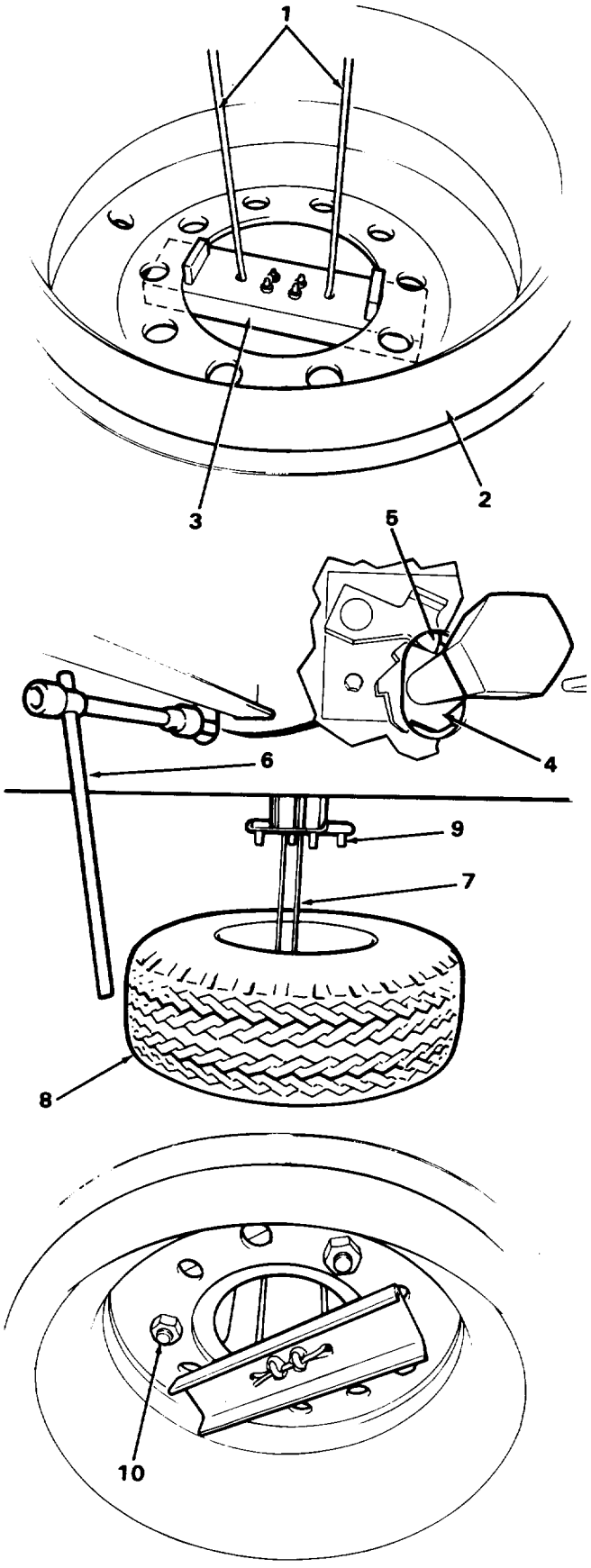
(5) Engage lug wrench (6) with hex end of carrier shaft.

(6) Turn lug wrench clockwise to take up slack in cable (7). Be sure tire plate is centered and leveled in wheel rim.

(7) Continue to turn lug wrench to raise spare tire (8) fully until carrier studs (9) enter stud holes in rim,

(8) Install four wheel nuts (10) to secure spare tire to carrier.

(9) Remove lug wrench and place in storage box.



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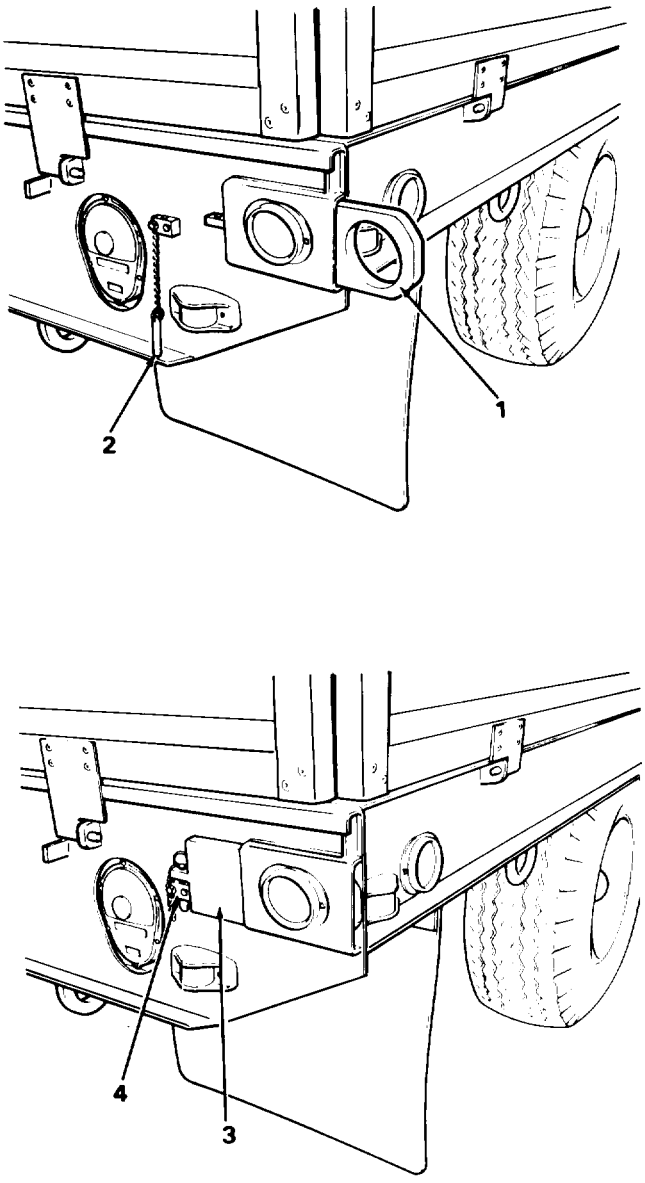
2-19. LIFTING EYES

a. To extend lifting eyes(1), pull out lock pins (2) and slide lifting eyes outward fully.

b. To retract lifting eyes (3), slide lifting eyes inward fully so ears are over retaining blocks (4). Insert lock pins.



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Section IV. OPERATION UNDER UNUSUAL CONDITIONS

	Page
Operation in Extreme Cold	2-27
Operation in Extreme Heat	2-27
Operation in Rainy or Humid Conditions	2-27
Operation in Salt Water Areas	2-27
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Operation with SPLL Adapter	2-29
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2-20. OPERATION IN EXTREME COLD

a. General.

(1) Be careful when placing the HEMAT in operation after a shutdown. Congealed lubricants can cause part failure.

(2) Tires may be frozen to the ground or have a flat spot if they were underinflated.

(3) Brakeshoes may be frozen to the brake drums. Notify organizational maintenance.

(4) Refer to FM 9-207 and FM 21-305 for special instructions on driving hazards in snow and ice that may be encountered during extremely cold weather conditions.

b. At-Halt Parking.

(1) For short shutdown periods, park in a sheltered spot out of the wind.

(2) For long shutdown periods, if high, dry ground is not available, prepare a footing of planks or brush,

(3) Remove all built-up ice and snow as soon as possible after shutdown.

(4) Cover and shield the HEMAT with canvas covers (if available) but keep the ends of the covers off the ground to prevent them from freezing to the ground.

2-21. OPERATION IN EXTREME HEAT

a. Do not park the HEMAT in the sun for long periods of time as heat and sunlight will shorten the life of the tires.

b. Cover the HEMAT with canvas (if available) to protect it from heat, sun and dust.

2-22. OPERATION IN RAINY OR HUMID CONDITIONS

a. Frequently inspect, clean, and lubricate inactive equipment to prevent rust and fungus accumulation.

b. Check canvas covers (if available) periodically for deterioration and damage.

2-23. OPERATION IN SALT WATER AREAS

a. Salt water will cause metal parts to rust and corrode. Clean, inspect, and lubricate frequently.

b. Do not drive the HEMAT through more than 48 inches of water. Clean, inspect, and lubricate immediately after salt water fording or when the tactical situation permits.

2-24. OPERATION IN SNOW

Refer to FM 21-305 for special instructions on operations in snow.

[2-25. OPERATION IN MUD

CAUTION
Under no circumstances will the trailer be pushed at the rear or damage to trailer may result.

a. If one or more wheels sink into the mud, it may be required to jack-up the mired wheel and insert planking or matting beneath it.

b. Clean off all mud as soon after operation as possible.

2-26. OPERATION IN DUSTY OR SANDY AREAS

CAUTION
Under no circumstances will the trailer be pushed at the rear or damage to trailer may result.

Frequently clean, inspect and lubricate the trailer.

2-27. OPERATION WITH AIR BRAKE FAILURE

CAUTION
Do not attempt to operate the trailer with the air chamber springs caged except to move the vehicle out of the traveled portion of the highway in the event of an air system failure.

a. Caging Brake Air Chambers.

(1) Block trailer to prevent movement by using chocks under wheels.

WARNING
Do not remove flange nuts or bolts. High spring pressure inside of air chamber can cause injury if released.

(2) Remove nut (1), washer (2) and release stud (3) from mounting pocket (4) on brake air chamber (5).

(3) Remove plug (6).

(4) Insert release stud (3) into chamber hole and turn one-quarter turn clockwise to engage stud in pressure plate.

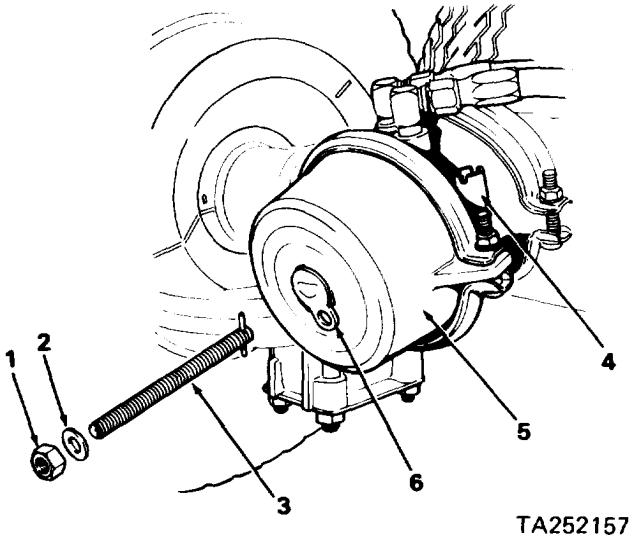
(5) Install nut (1) and washer (2) on release stud (3) and tighten nut to cage the air chamber springs.

(6) Repeat steps (2) through (5) for remaining brake air chambers.

(7) Remove chocks from under wheels.

(8) Move trailer to side of road with caution.

(9) Re-chock wheels to prevent trailer movement.



b. Uncaging Brake Air Chambers.

(1) Loosen and remove nut (1) and washer (2).

(2) Turn release stud (3) one-quarter turn counterclockwise to free stud from pressure plate. Withdraw release stud.

(3) Insert release stud (3) in pocket (4) and install nut (1) and washer (2) onto stud.

(4) Install plug (6) in brake air chamber (5).

(5) Remove wheel chocks.

2-28. OPERATION WITH SPLL ADAPTER

If it is necessary to tow the HEMAT with a SPLL vehicle, the SPLL adapter must be attached to the tongue of the trailer to allow additional clearance between the towing vehicle and trailer. All other operational procedures are the same as those described in Chapter 2, Section 111.

a. SPLL Adapter Installation.

(1) Remove one hex nut (1) and cap) screw (2) to detach SPLL adapter from inside tool box.

(2) Remove three hex nuts (1), four lock washers (4) and three cap screws (2) from slot (5) in SPLL adapter (3).

(3) Attach SPLL adapter (3) under tongue (6) with four hex nuts (1), lock washers (4) and cap screws (2). Tighten hex nuts.

(4) Push trailer parking brake control knob (7) to release parking brakes.

b. Removal of SPLL Adapter.

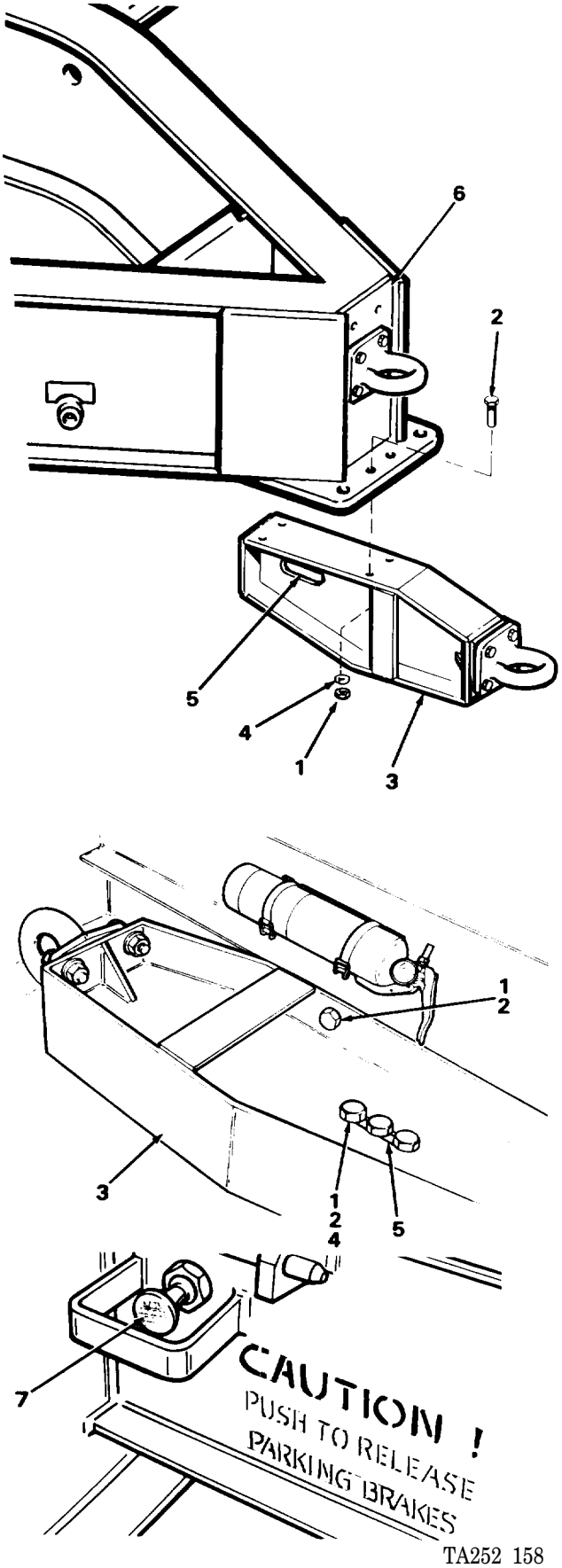
(1) Remove four hex nuts (1), lock washers (4) and cap screws (2) to detach SPLL adapter (3) from underside of trailer tongue (6).

(2) Install three hex nuts (1), four lock washers (4) and three cap screws (2) in slot (5) in SPLL adapter (3).

(3) Fasten SPLL adapter (3) to trailer frame in tool box with one hex nut (1) and cap screw (2). Tighten hex nut.

2-29. FRESH WATER FORDING

Maximum fording depth of the HEMAT is 48 inches. No special maintenance is required.



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CHAPTER 3

OPERATOR MAINTENANCE

Section 1. LUBRICATION INSTRUCTIONS

	Page		Page
General	3-1	Lubrication Chart	3-1

3-1. GENERAL

a. Lubrication Instructions. The lubrication chart (para. 3-2) prescribes cleaning and lube procedures, proper materials for Iubing, and lube intervals. The location of fittings and points is also included. An overall view showing lube points precedes the detailed views.

3-2. LUBRICATION CHART

Lubrication instructions are mandatory.

Service intervals are based on normal operation. Lube more often during constant use and lube less often during inactive periods.

Relubricate after salt water fording.

Clean fittings before lubricating.

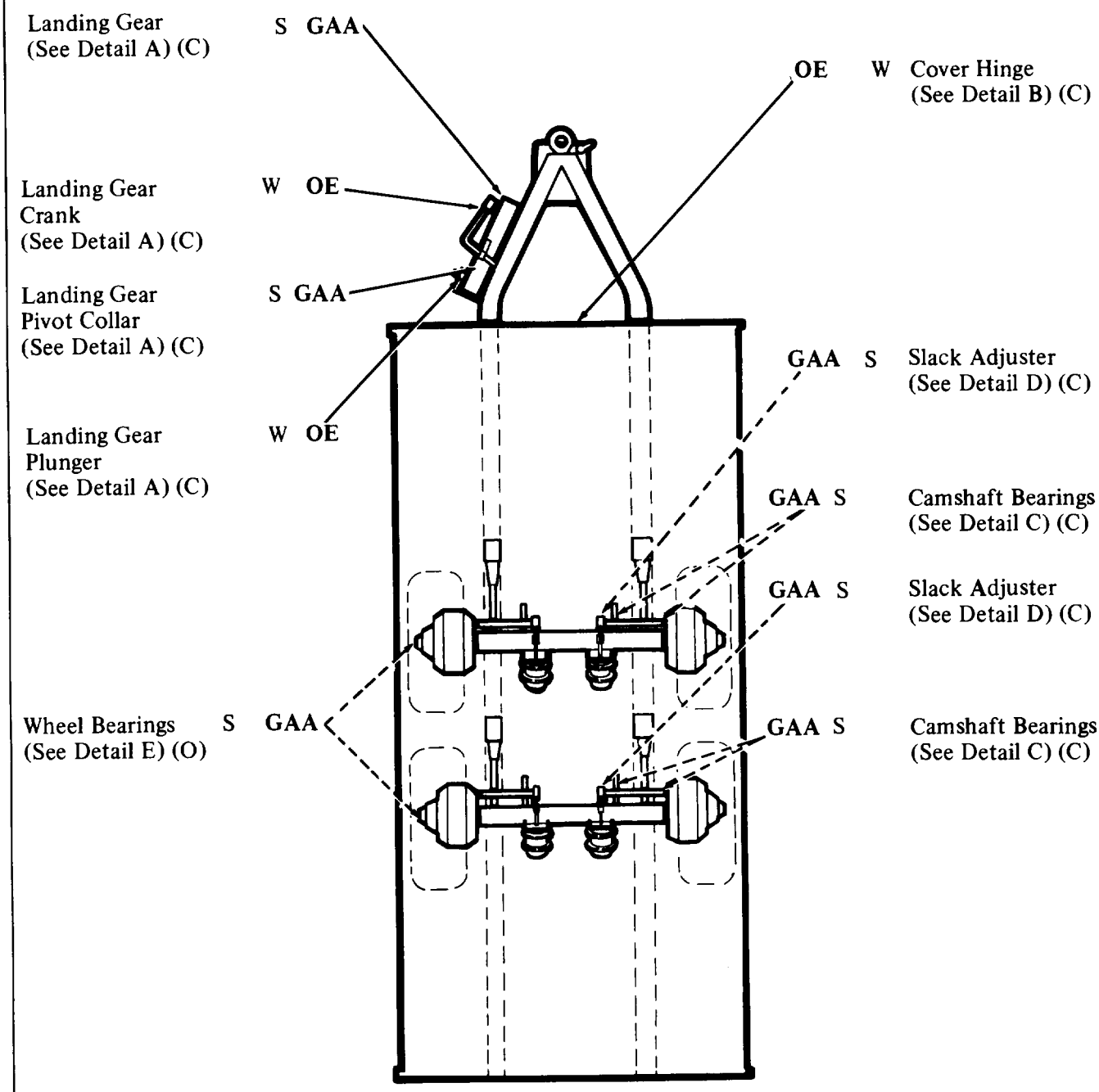
Dotted lines indicate lube points on both sides of the equipment.

DO NOT overlubricate; wipe off excess lubricant.

KEY

Lubricants	Above +32°F (o°c)	Expected Temperature +40°F to -lO°F (+4°C to -23°C)	*O°F to -65°F (-18°C to -54°C)
GAA Grease, Lubricating, Automotive and Artillery (item 4, app E)	GAA	GAA	GAA
OE Lubricating Oil, Internal Combustion Engine (item 6, app E)	OE/HDO30	OE/HDO10	
OEA Lubricating Oil, Internal Combustion Engine, Subzero (item 7, app E)			* **OEA**

*For Artic operation, refer to FM 9-207.



NOTE

Lubricate gate hinge pins and gate lock pins as required with OE (C).

Intervals: W – Weekly S – Semiannually

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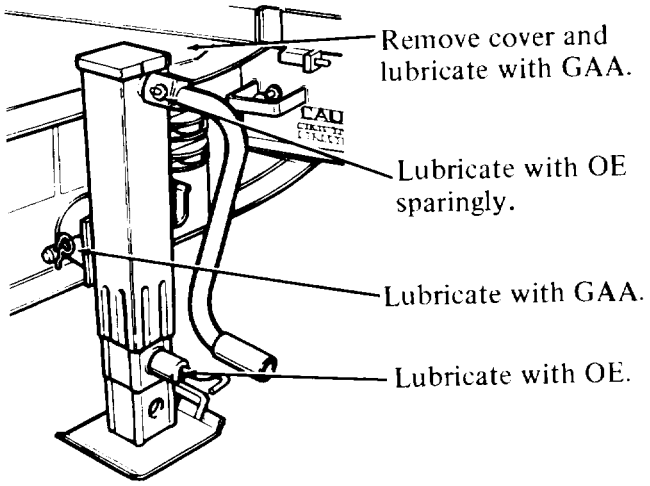
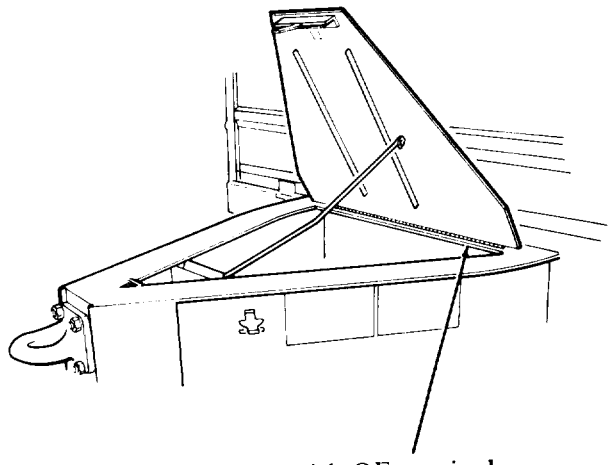
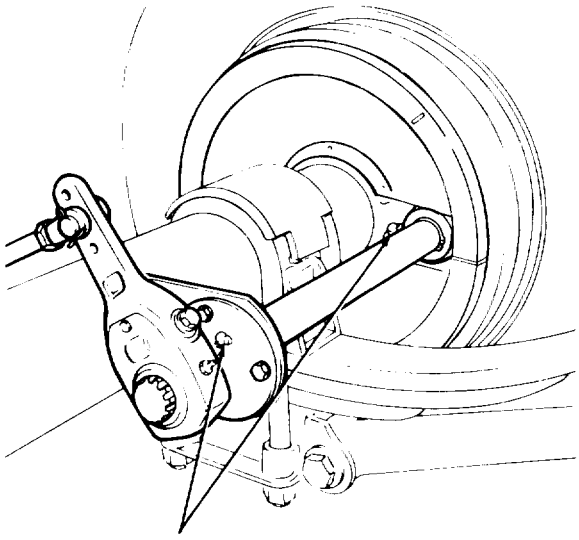
DETAIL A
LANDING GEAR (4 POINTS)



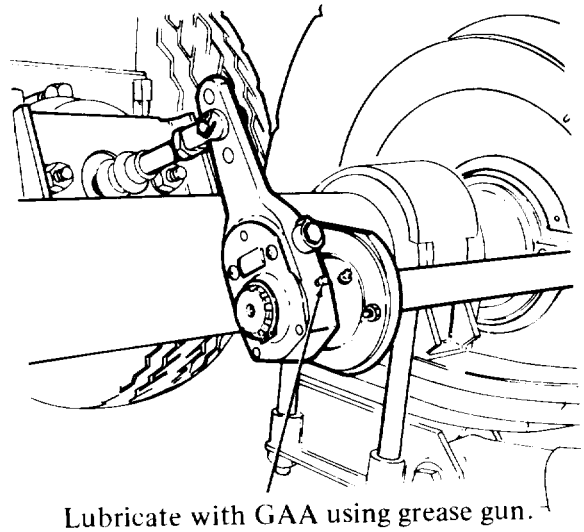
DETAIL B
COVER HINGE (1 POINT)



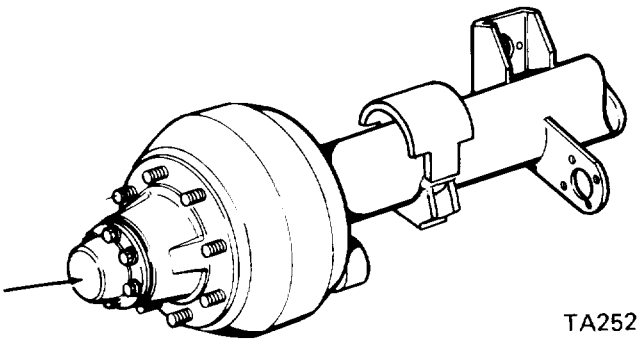
DETAIL C
CAMSHAFT BEARINGS (8 POINTS)



DETAIL D
SLACK ADJUSTERS (4 POINTS)



DETAIL E
WHEEL BEARINGS (4 POINTS)



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Section II. OPERATOR TROUBLESHOOTING PROCEDURES

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Symptom Index 3-4
Troubleshooting Table 3-4

3-3. SYMPTOM INDEX

Page No.

BRAKES
Brakes will not release ., ... 3-6
Grabbing brakes 3-7
Hard pulling 3-7

ELECTRICAL SYSTEM
All lamps do not light 3 4
One or more (but not all) lights will not light..... 3-5
Dim or flickering lights ., ... 3-6

LANDING GEAR
Landing gear is difficult to operate 3-7

TIRES
Excessively worn, scuffed, or flat spots on tires, ...3-8

I 3-4. TROUBLESHOOTING TABLE I

a. Table 3-1 lists the common malfunctions which you may find during the operation of the HEMAT or its components. You should perform the test/inspections and corrective maintenance in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or it is not corrected by the listed corrective actions, notify your supervisor.

Table 3-1. Operator Troubleshooting Table

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
ELECTRICAL SYSTEM
1. ALL LAMPS DO NOT LIGHT.
step 1. Check lights on towing vehicle including turn signals and stop lights.
a. If towing vehicle lights do not light, notify organizational maintenance.
b. If towing vehicle lights come on, proceed to step 2.
Step 2. Check intervehicular cable.
a. If cable is not properly connected, reconnect cable.
b. If cable is properly connected, proceed to step 3.

Table 3-1. Operator Troubleshooting Table (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ELECTRICAL SYSTEM (cont)

1. ALL LAMPS DO NOT LIGHT (cont).

Step 3. Check connectors for dirty or corroded pins. Check for damaged pins.

a. If pins are dirty or corroded, clean the pins.

b. If pins are damaged, notify organizational maintenance.

c. If the above steps do not correct the malfunction, notify organizational maintenance.

2. ONE OR MORE (BUT NOT ALL) LIGHTS WILL NOT LIGHT.

Step 1. Check for burned out or defective lamps.

a. If lamps are burned out or defective, replace lamps (para. 3-5).

b. If lamps are not burned out or defective, proceed to step 2.

Step 2. Check for broken lead wires or loose connections.

a. If connections are loose, tighten connections.

b. If lead wires are broken, notify organizational maintenance.

c. If connections are not loose or broken, proceed to step 3.

step 3. Check light assembly for damage.

a. If light assembly is damaged, notify organizational maintenance.

b. If lens and light assembly are not damaged, proceed to step 4.

step 4. Check for dirty or corroded bulb socket.

a. If socket is dirty, clean socket.

b. If the above steps do not correct the malfunction, notify organizational maintenance.

Table 3-1. Operator Troubleshooting Table (cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ELECTRICAL SYSTEM

3. DIM OR FLICKERING LIGHTS.

Step 1. Check electrical connections for loose, dirty, or corroded pins.

a. If connections are loose, tighten connections.

b. If connector pins are dirty or corroded, clean pins.

c. If connections are tight and clean, proceed to step 2.

Step 2. Check for defective lamp.

a. If lamp is defective, replace lamp (para. 3-5).

b. If lamp is not defective and malfunction is not corrected, notify organizational maintenance.

BRAKES

1. BRAKES WILL NOT RELEASE.

Step 1. Check that towing vehicle to HEMAT air supply is turned on.

a. If air is shut off, turn on air supply.

b. If air supply is on, proceed to step 2.

Step 2. Check connections of air hoses between towing vehicle and HEMAT.

a. If air hoses are not properly connected (Emergency to Emergency, Service to Service), reconnect air hoses.

b. If air lines are connected properly, proceed to step 3.

Step 3. Disconnect air hoses from HEMAT to towing vehicle.

a. Operate brake release valve. Brakes should release.

b. If brakes do not release, notify organizational maintenance.

Table 3-1. Operator Troubleshooting Table (cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

BRAKES

2. GRABBING BRAKES.

WARNING

Keep away from drain cocks when draining air tanks to prevent injury to eyes by compressed air.

Check for moisture in air tanks by opening drain cocks.

a. If moisture is in tanks, allow to drain.

b. If tanks are dry and malfunction is not corrected, notify organizational maintenance.

3. HARD PULLING.

Check for cross connected air hoses.

a. If air hoses are cross connected, connect properly.

b. If air hoses are connected properly, notify organizational maintenance

LANDING GEAR

1. LANDING GEAR IS DIFFICULT TO OPERATE.

Step 1. Check for dirt, debris and other foreign materials.

a. Remove dirt, debris and other foreign materials.

b. If landing gear does not operate properly, proceed to step 2.

Step 2. Check for lack of lubrication.

a. Lubricate landing gear (para. 3-2).

b. If landing gear has sufficient grease, proceed to step 3.

Step 3. Check for misalined, bent, or damaged landing gear.

If landing gear is misalined, bent, or damaged, notify organizational maintenance.

Table 3-1. Operator Troubleshooting Table (cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

TIRES

1. EXCESSIVELY WORN OR SCUFFED TIRES OR FLAT SPOTS ON TIRES.

Step 1. Check tire pressure.

a. If tire pressure is less than 85 psi (4.07 KPa), inflate tires to 85 psi (maximum).

b. If tire pressure is 85 psi, proceed to step 2.

Step 2. Check for loose, cracked, or broken wheels.

a. If wheel nuts are loose, tighten nuts.

b. If wheel is cracked or broken, replace with spare wheel and tire (para. 3-6).

c. If wheel is secure and not cracked or broken, proceed to step 3.

Step 3. Check suspension system for damaged rubber bushings, springs and loose or missing bolts and nuts.

a. If suspension system is damaged or has loose or missing bolts and nuts, notify organizational maintenance.

b. If suspension system is not damaged and all hardware is complete and secure, and problem still exists, notify organizational maintenance.

Section III. OPERATOR MAINTENANCE PROCEDURES

Page
Electrical System 3-9
Page
Wheels and Tires 3-10

3-5. ELECTRICAL SYSTEM

a. General. Maintenance of the electrical system at crew level is limited to replacement of the lamps in the composite lights, marker lights and/or running lights.

b. Composite Lights. Replace lamps as follows:

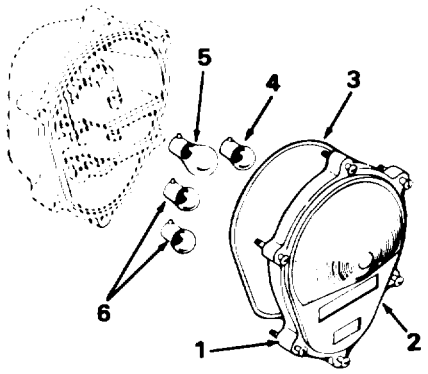
(1) Loosen six captive screws (1) and remove lens assembly (2) with packing (3).

(2) Remove defective lamp (4, 5 or 6) by pressing in and rotating lamp counterclockwise until it releases; withdraw lamp from socket.

(3) Insert new lamp in socket, press in and rotate lamp clockwise until it locks in place.

NOTE
Be sure preformed packing (3) is seated between light body and lens assembly to seal the unit properly.

(4) position lens assembly (2) on body and tighten six captive screws (1).



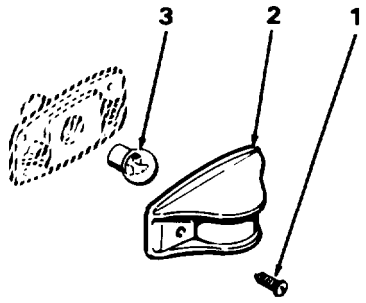
c. Clearance Marker Lights. Replace lamps as follows:

(1) Remove two screws (1) and light cover (2).

(2) Remove lamp (3) by pressing in and rotating lamp counterclockwise until it releases; withdraw lamp from socket.

(3) Insert new lamp in socket, press in and rotate lamp clockwise until it locks in place.

(4) Position light cover (2) on body and install two screws (1) to attach covers.



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3-6. WHEELS AND TIRES

Materials/Tools

Lug wrench (in tool box)
Tire changing block (in tool box)
Breaker bar
Prime mover jack

a. General. Maintenance of the wheels and tires is limited to exchanging a defective wheel and tire with a serviceable wheel and tire. Refer to paragraph 2- I 8 for operation of the spare tire carrier.

b. Removal of Wheels and Tires.

(1) Using lug wrench and breaker bar from tool box, loosen wheel nuts on the wheel but do not remove.

NOTE
Right wheel nuts are turned counterclockwise to loosen and left wheel nuts are turned clockwise to loosen.

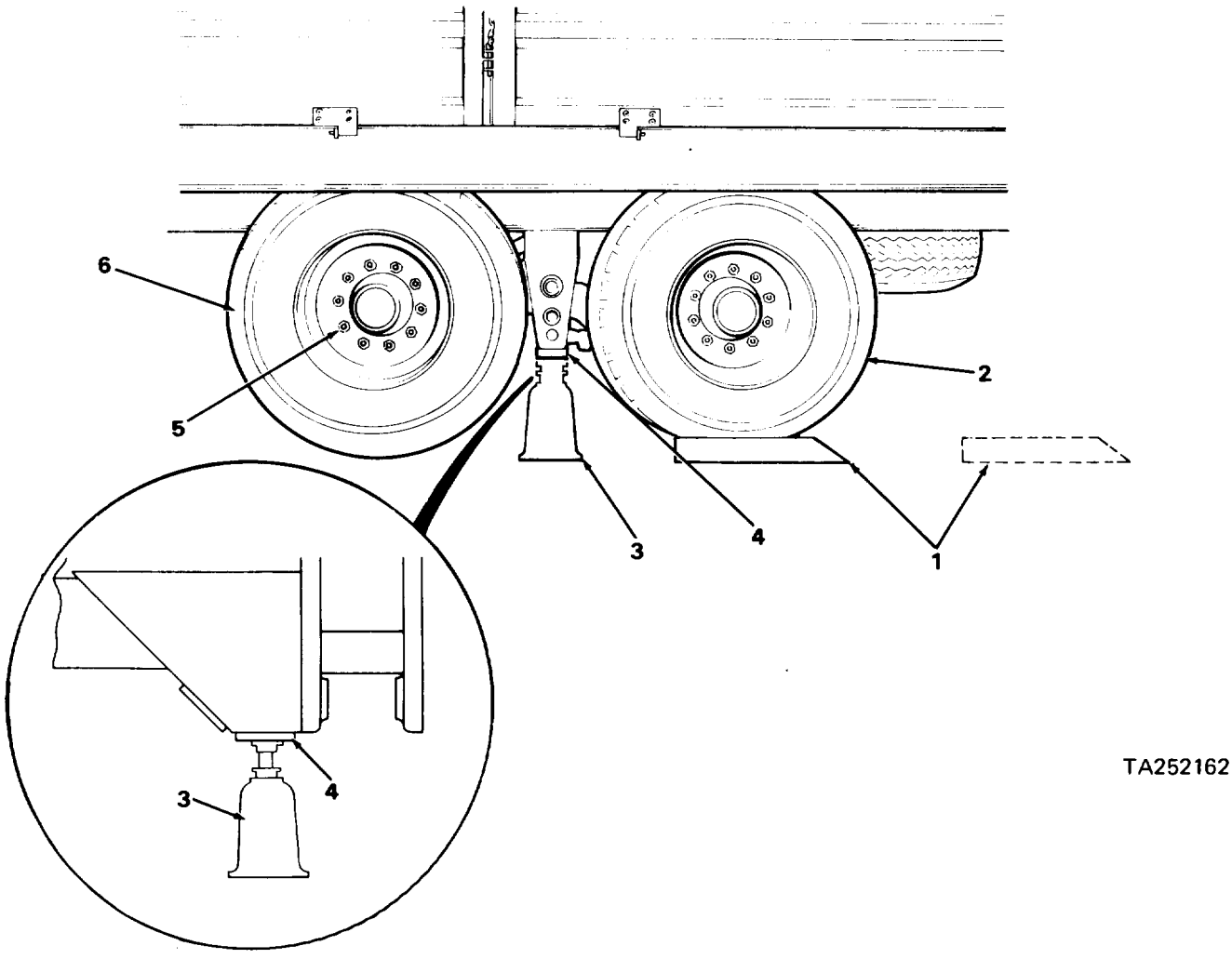
(2) Place tire changing block (1) in front of good tire (2).

(3) Pull HEMAT forward so tire is up on block.

(4) Place jack (3) underneath equalizer hanger and socket (4).

(5) Jack up equalizer hanger, making sure jack head enters socket (4).

(6) Remove wheel nuts (5). Remove wheel and tire (6).



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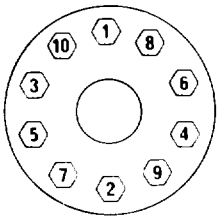
3-6. WHEELS AND TIRES (cont)

c. Installation of Wheels and Tires.

(1) Place spare wheel and tire (6) over wheel lugs and install the wheel nuts (5). Tighten wheel nuts using the lug wrench.

NOTE

Right wheel nuts are turned clockwise to tighten and left wheel nuts are turned counterclockwise to tighten.



TIGHTENING SEQUENCE FOR LUG NUTS

TA252163

(2) Lower jack (3) until tire is on ground. Remove jack.

CAUTION

Failure to tighten wheel nuts may result in fatigue rupture of the wheel studs.

(3) Retighten wheel nuts using lug wrench and breaker bar.

(4) Pull HEMAT forward off tire changing block (1).

(5) Remove tire changing block (1). Stow block and lug wrench in tool box.

(6) Notify organizational maintenance of tire change so wheel nuts may be torqued to 450-5001b-ft (610-678 Nm) and tire repaired.

CHAPTER 4

FIELD MAINTENANCE INSTRUCTIONS (ORGANIZATIONAL MAINTENANCE)

Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

Page
Common Tools and Equipment 4-1
Special Tools, TMDE and Support Equipment 4-1
Repair Parts..... 4-1

4-1. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the table of organization and equipment (TOE) or the modified table of organization and equipment (MTOE) applicable to your unit.

4-2. SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

Tire iron T47A (reference 7, app B, section III)
Tire iron T46B (reference 8, app B, section III)
Locking jaw pliers (reference 9, app B, section III)

4-3. REPAIR PARTS

Repair parts are listed and illustrated in appendix F of this manual.

Section II. SERVICE UPON RECEIPT OF MATERIAL

Page
Unpacking and Checking the Equipment 4-2
Service the Equipment.....4-2

4-4. UNPACKING AND CHECKING THE EQUIPMENT

a. Remove any metal strapping, plywood, tapes, seals, wrapping paper or any other shipping and protective items.

WARNING

Solvent cleaning compound is an environmentally compliant product and is low in toxicity. However, it may be irritating to the eyes and skin due to its base stock. The use of protective gloves and goggles is required. Use the cleaning compound in well-ventilated areas and keep away from open flames and other sources of ignition.

b. If any exterior parts are coated with rust preventive compound, remove it with solvent cleaning compound.

c. Inspect the equipment for damage incurred during shipment.

d. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 750-8.

4-5. SERVICING THE EQUIPMENT

a. Perform the preventive maintenance checks and services contained in Tables 2-1 and 4-1.b.

b. Lubricate all points as shown in the Lubrication Instructions (Chapter 3, Section I) regardless of interval.

c. Schedule the next preventive maintenance checks and services on DD Form 314, Preventive Maintenance Schedule and Record.

d. Report all deficiencies on DA Form 2407 if the deficiencies appear to involve unsatisfactory design.

e. Perform a break-in road test of 25 miles at a maximum speed of 50 miles per hour.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

Page
General....4-3
Organizational Preventive Maintenance Checks and Services....4-3

4-6. GENERAL

To ensure that the trailer is ready for operation at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure. Table 4-1 contains a tabulated listing of preventive maintenance checks and services to be performed by organizational maintenance personnel. All deficiencies and shortcomings will be recorded as well as the corrective action taken on DA Form 2404 at the earliest possible opportunity.

4-7. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

a. The item numbers of table 4-1 indicate the sequence of the PMCS. Perform at the intervals shown below:

(1) Do your semiannual (S) PREVENTIVE MAINTENANCE once each 6 months.
(2) Do your annual (A) PREVENTIVE MAINTENANCE once each year.

b. If something doesn't work, troubleshoot it with the instructions in this manual or notify your supervisor.

c. Always do your preventive maintenance in the same order, so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.

d. If anything looks wrong and you can't fix it, write it down on your DA Form 2404. If you find something seriously wrong, report it to direct support as soon as possible.

WARNING

Solvent cleaning compound is an environmentally compliant product and is low in toxicity. However, it may be irritating to the eyes and skin due to its base stock. The use of protective gloves and goggles is required. Use the cleaning compound in well-ventilated areas and keep away from open flames and other sources of ignition.

(1) Keep it clean: Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use solvent cleaning compound to clean metal surfaces. Use soap when you clean rubber or plastic material.

(2) Bolts, nuts, and screws: Check that they are not loose, missing, bent, or broken. You can't try them all with a tool, of course; but look for chipped paint, bare metal, or rust around bolt heads. Tighten any that you find loose.

(3) Welds: Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to direct support maintenance.

(4) Electric wires and connectors: Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connections and make sure the wires are in good condition.

(5) Air hoses: Look for wear, damage, and leaks. Make sure clamps and fittings are tight. If a leak comes from a loose fitting or connector, tighten it. If something is broken or worn out, either correct it or report it to your supervisor. (Refer to App B.)

Table 4-1. Organizational Preventive Maintenance Checks and Services

S – Semiannually A - Annually

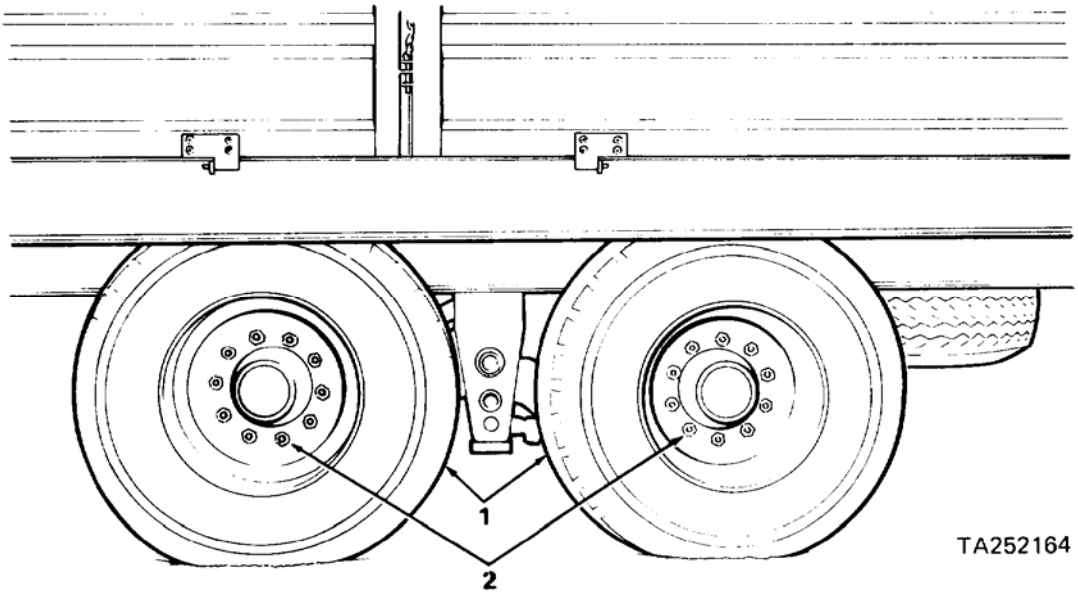
Item No.	Interval S	Interval A	ITEM TO BE INSPECTED Procedure:
			NOTE Perform operator/crew PMCS prior to or in conjunction with organizational PMCS if: a. There is a delay between the daily operation of organizational PMCS. b. Regular operator is not assisting/participating.
1		•	WHEELS AND TIRES Rotate and match tires (1) according to tread design and degree of wear. See TM 9-2610-200-20 for acceptable limits in matching tires. Tighten wheel nuts (2) to 450-500 lb-ft. (610-678 N•m). 
2	•		SERVICE BRAKES a. Inspect hub and drum for visible wear and scoring (para 4-14c). b. Inspect wheel bearings for visible wear and seal for deterioration and damage (para 4-14c). c. Inspect brake shoes for wear (para 4-15a). d. Inspect camshafts for visible wear and damage (para 4-15b). e. Inspect camshaft bearings for visible wear (para 4-15b).

Table 4-1. Organizational Preventive Maintenance Checks and Services (cont)

S – Semiannually A - Annually

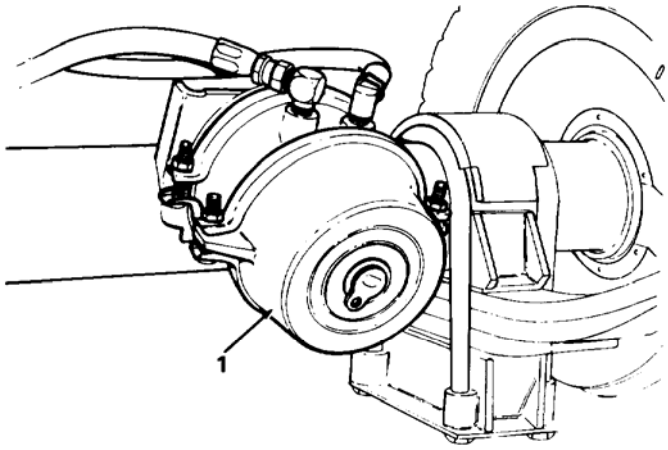
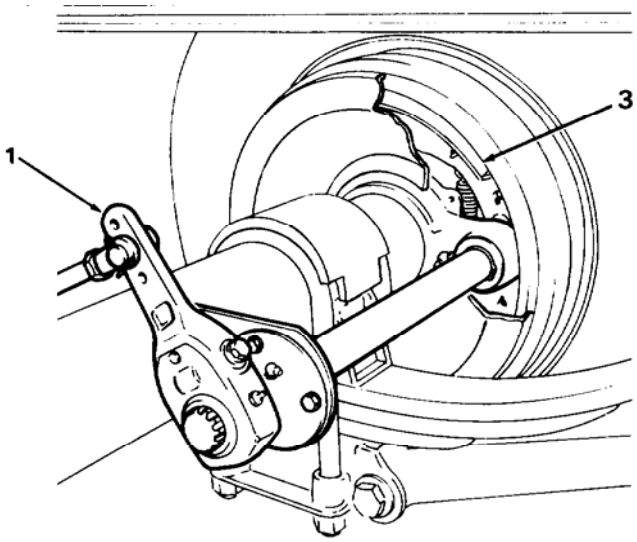
Item No.	Interval S	Interval A	ITEM TO BE INSPECTED Procedure:
3	•		BRAKE AIR CHAMBERS **WARNING** **Do not attempt to disassemble brake air chambers (1). The springs inside the chambers are under heavy tension and may cause severe injury if released during disassembly.** **Inspect brake air chambers (1) for visible damage, particularly push rod boots. Replace defective boots.** 
4	•		SLACK ADJUSTERS a. Inspect slack adjusters (1) for damage. b. Remove dust shield (2) and check brake shoe (3) clearance (para 4-15c). 

Table 4-1. Organizational Preventive Maintenance Checks and Services (cont)

S – Semiannually **A - Annually**

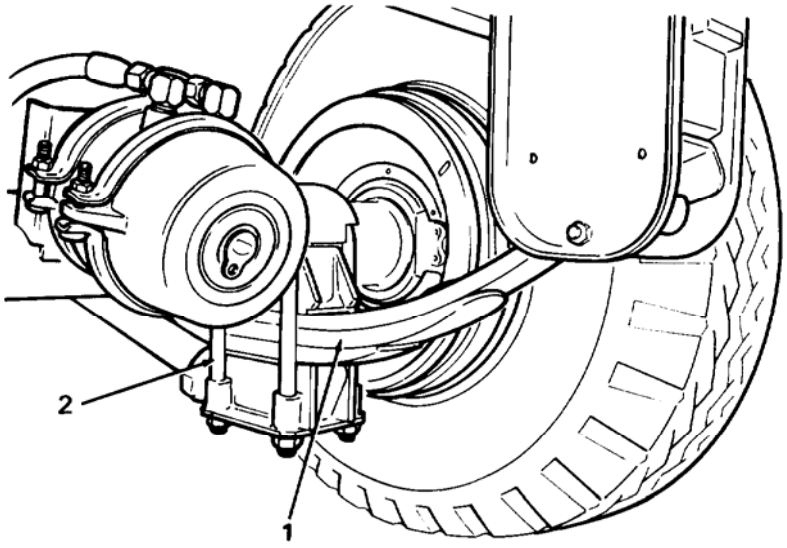
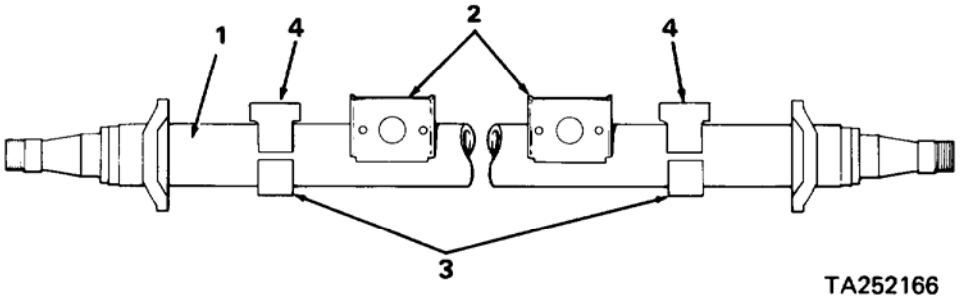
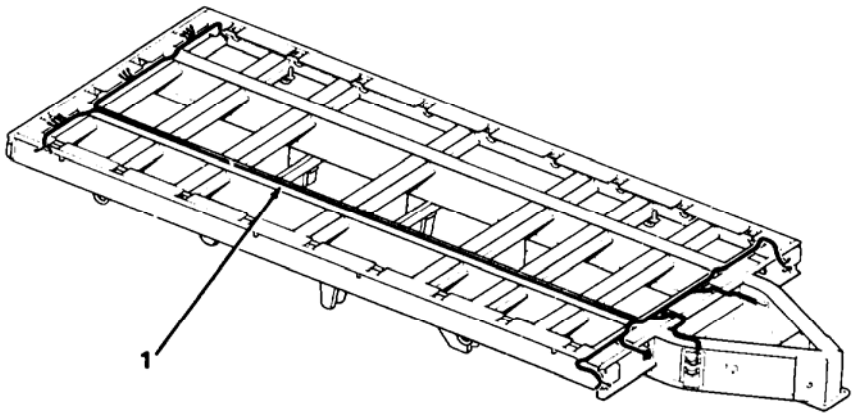
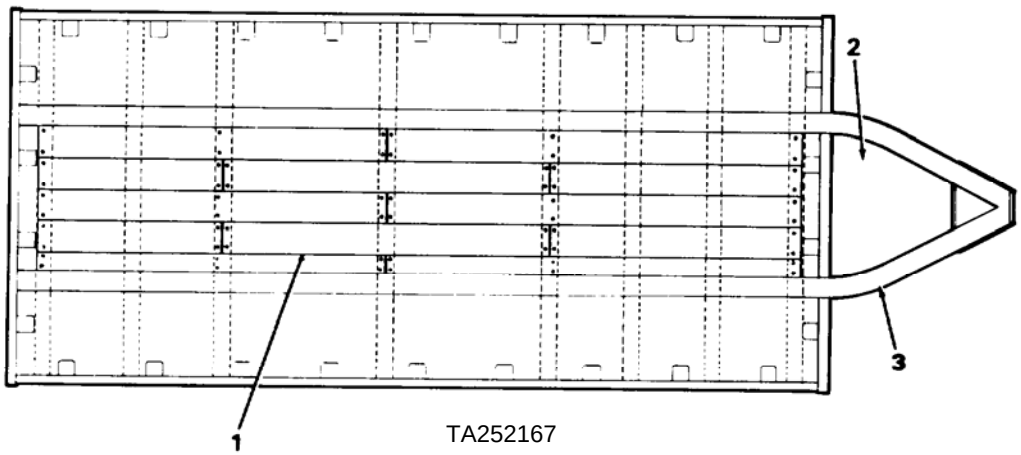
Item No.	Interval S	Interval A	ITEM TO BE INSPECTED Procedure:
5	•		SPRINGS AND U-BOLTS a. Inspect springs (1) for sagging and broken leaves. Notify direct support maintenance. b. Inspect U-bolts (2) for breakage and loose nuts. Tighten loose nuts to 350 lb-ft (475 Nm). Replace defective U-bolt(s). Notify direct support maintenance. 
6	•		AXLES Inspect axles (1) for cracks, damaged brackets (2), pads (3), and axle bumpers (4). Replace defective axle(s). Notify direct support maintenance. 

Table 4-1. Organizational Preventive Maintenance Checks and Services (cont)

S – Semiannually **A - Annually**

Item No.	Interval S	Interval A	ITEM TO BE INSPECTED Procedure:
7		•	WIRING HARNESS Inspect wiring harness (1) for loose mounting, broken wires, damaged insulation and connections. Repair or replace defective wiring harness (para 4-13). 
8		•	FLOOR BOARDS AND FRAME a. Inspect floorboards (1) for breakage and warpage. Report deficiencies to direct support maintenance.
	•		b. Inspect storage box cover (2) for loose hinge or damaged cover. Replace defective parts (para 4-30).
	•		c. Inspect bumpers and splash guards for deterioration and damage. Replace defective bumpers (para 4-24) and splash guards (para 4-34).
	•		d. Inspect frame (3) for peeling paint, distortion and other damage. Report deficiencies to direct support maintenance.  TA252167

Section IV. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES

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4-8. SYMPTOM INDEX

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Difficulty in lowering or raising landing gear 4-14

SPRINGS AND SUSPENSION
Improper spring action 4-14

TIRES
Excessively worn, scuffed tires, or flat spots on tires 4-15

4-9. TROUBLESHOOTING TABLE

a. Table 4-2 lists the common malfunctions which may be found during the operation or maintenance of the HEMAT or components. You should perform the test/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or it is not corrected by the listed corrective actions, notify your supervisor.

Table 4-2. Troubleshooting Table

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ELECTRICAL SYSTEM
(See Schematic Diagram, page no. 4-21)

1. ALL LAMPS DO NOT LIGHT.

Step 1. Check intervehicular cable (para. 4-12).

a. If cable is defective, replace cable.

b. If cable is not defective, proceed to step 2.

Step 2. Check for ground or open circuit in wiring (para. 4-12).

If wiring has a ground or open circuit, repair or replace wiring (para. 4-13).

2. ONE OR MORE LAMPS (BUT NOT ALL) WILL NOT LIGHT.

Step 1. Check for defective light assemblies (para. 4-12).

a. Replace defective light assemblies.

b. If light is not damaged, proceed to step 2.

Step 2. Check for ground or open circuit in wiring (para. 4-12).

If wiring has a ground or open circuit, repair or replace wiring.

3. DIM OR FLICKERING LIGHTS.

Step 1. Check for defective light assemblies (para. 4-12).

a. Replace or repair defective light assemblies.

b. If light assemblies are not defective, proceed to step 2.

Step 2. Check for intermittent ground or open circuit (para. 4-12).

If wiring is defective, repair or replace wiring.

Table 4-2. Troubleshooting Table (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

BRAKES

1. BRAKES WILL NOT RELEASE.

Step 1. Check operation of air brake chambers (Table 2-1).

a. If one air brake chamber does not release, replace defective brake chamber.

b. If all air brake chambers do not release, proceed to step 2.

Step 2. Check operation of parking brake control (Table 2-1).

a. If parking brake control does not operate, replace parking brake control.

b. If replacing parking brake control does not correct the defect, proceed to step 3.

Step 3. Check trailer valve operation for application of emergency air to air brake chambers.

If emergency air is not being applied to air brake chambers, replace trailer valve,

2. NO BRAKES OR WEAK BRAKES.

Step 1. Check for low air pressure (leakage at connection, air lines or valves) (Table 2-1).

a. If air lines/connections are leaking, repair or replace as needed,

b. If valve is leaking, replace defective valve.

c. If air lines connections or valves are not leaking, proceed to step 2.

Step 2. Inspect for grease on brake lining.

a. If grease is present on brake linings, replace defective oil seals and brake shoes.

b. If grease is not present on brake lining, proceed to step 3.

Step 3. Check for worn brake lining (Table 4-1).

a. If brake lining is worn, replace brake shoe.

b. If brake lining is not worn, proceed to step 4.

Step 4. Check brake adjustment (para. 4-15c).

a. Adjust brake shoes if out of adjustment.

b. If brakes are adjusted, proceed to step 5.

Table 4-2. Troubleshooting Table (cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

BRAKES

2. NO BRAKES OR WEAK BRAKES (cont).

Step 5. Check for relay valve operation by observing action of air brake chambers.

a. If air brake chambers do not operate, replace relay valve (para. 4-18a).

b. If action of air brake chambers is not positive, replace relay valve.

c. If a single air brake chamber does not operate properly, replace brake chamber (para. 4-16).

3. **SLOW BRAKE APPLICATION OR SLOW RELEASE.**

Step 1. Check for low air pressure (leakage at connections, air lines or valves) (Table 2-1).

a. If air lines/connections are leaking, repair or replace as needed.

b. If valve is leaking, replace defective valve.

c. If air lines/connections and valves are not leaking, proceed to step 2.

Step 2. Remove and check for restrictions in air lines and hoses (para. 4-17).

a. If air lines or hoses are restricted, replace as required.

b. If air lines or hoses are not restricted, proceed to step 3.

Step 3. Check for damaged or broken brake shoe springs (para. 4-15a).

a. If a spring is defective, replace spring.

b. If any spring is not defective, proceed to step 4.

Step 4. Check for air brake chamber operation (Table 2-1).

a. If one air brake chamber operates slowly, replace defective brake chamber.

b. If all air brake chambers operate slowly, replace relay valve.

c. If all air brake chambers still operate slowly, replace trailer valve.

Table 4-2. Troubleshooting Table (cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
BRAKES (cont)
4. GRABBING BRAKES.
Step 1. Check brake adjustment (para. 4-15c). a. If brakes are out of adjustment, adjust brakes. b. If brakes are not out of adjustment, proceed to step 2.
Step 2. Check for grease on brake lining. a. If grease is present, replace brake shoes and oil seals. b. If grease is not present on brake lining, proceed to step 3.
Step 3. Check for cracked, scored, or deformed brake drum (Table 4-1). a. If brake drum is cracked, scored, or deformed, replace brake drum. b. If brake drum is not cracked, scored, or deformed, proceed to step 4.
Step 4. Check for worn or loose brake linings (Table 4-1). If linings are worn or damaged, replace brake shoes.
5. HARD PULLING (ONE OR MORE BRAKE DRUMS RUNNING HOT).
Step 1. Check for cross connected air hoses. a. If hoses are cross connected, correct hoses properly. (See air system diagram, page 4-37). b. If hoses are not cross connected, proceed to step 2.
Step 2. Check brake adjustment (para. 4-15c). a. If brakes are out of adjustment, adjust brakes. b. If brakes are not out of adjustment, proceed to step 3.
Step 3. Check for weak or broken brake shoe springs (para. 4-15a). If a spring is defective, replace spring.

Table 4-2. Troubleshooting Table (cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

LANDING GEAR

DIFFICULTY IN LOWERING OR RAISING LANDING GEAR.

Step 1. Inspect for misaligned or damaged landing gear leg.

a. If leg is damaged or misaligned, replace landing gear

b. If leg is not damaged or misaligned, proceed to Step 2.

Step 2. Inspect for damaged gearing.

If gearing is damaged, replace landing gear.

SPRINGS AND SUSPENSION

IMPROPER SPRING ACTION.

Step 1. Check for loose or damaged U-bolts.

a. If U-bolts are loose, tighten U-bolts.

b. If U-bolts are damaged, replace U-bolts. Notify direct support maintenance.

c. If U-bolts are not damaged, proceed to Step 2.

Step 2. Check for broken or weak spring leafs.

a. If spring leafs are broken or weak, replace spring leaf(s). Notify direct support maintenance.

b. If springs are not broken or weak, proceed to Step 3.

Step 3. Check torque rods for looseness or damage.

If torque rods are loose or damaged, replace torque rod(s). Notify direct support maintenance.

Table 3-1. Operator Troubleshooting Table (cont)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

TIRES

EXCESSIVELY WORN OR SCUFFED TIRES OR FLAT SPOTS ON TIRES.

NOTE
Refer to para. 3-6 for jacking procedure.

Step 1. Check for loose wheels.

a. If wheels are loose, tighten wheel nuts.

b. If wheels are not loose, proceed to Step 2.

Step 2. Check for loose wheel bearings (para. 4-14e).

a. If wheel bearings are loose, adjust wheel bearings.

b. If wheel bearings are not loose, proceed to Step 3.

Step 3. Check suspension system for damaged rubber bushings, springs, and loose or missing bolts and nuts.

a. If suspension system is damaged or has loose or missing bolts and nuts, replace defective components. Notify direct support maintenance.

b. If suspension system is not damaged and all hardware is complete and secure, replace defective components. Notify direct support maintenance.

Section V. MAINTENANCE OF ELECTRICAL SYSTEM

	Page
Composite Lights	4-16
Clearance Marker Lights	4-17
Testing Electrical System	4-17
Wiring Harness	4-18

4-10. COMPOSITE LIGHTS

Materials/Tools

General mechanics tool kit

a. Removal.

(1) Tag and disconnect connectors (1) from wiring harness. Remove plastic tyrap (2).

(2) Remove two cap screws (3) and lock washers (4) to detach each composite light (5). Remove light (5).

b. Repair.

(1) Loosen six captive screws (6) and remove lens (7).

NOTE

Do not remove packing (8) unless damaged.

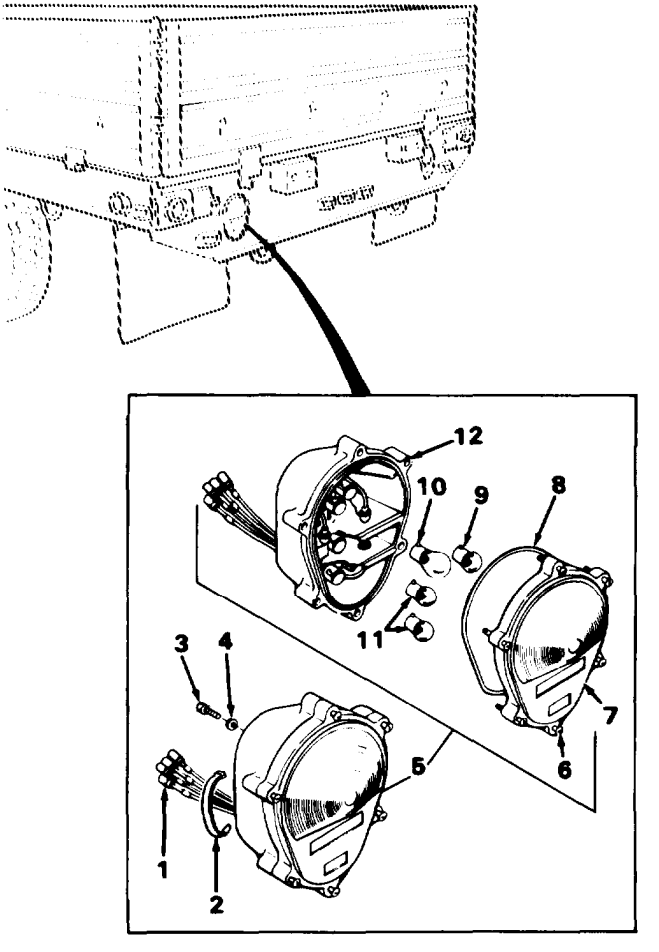
(2) Replace any defective lamps (9, 10 and 11).

(3) Install new packing (8) if packing was removed in lens (6) and fasten unit to body (12) with captive screws (6).

c. Installation.

(1) Install composite light (5) on trailer with two cap screws (3) and lock washers (4).

(2) Connect connectors (1) to wiring harness. Make sure that tag or marker numbers on wires correspond. Install tyrap (2).



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4-11. CLEARANCE MARKER LIGHTS

Materials/Tools

General mechanics tool kit

All clearance marker lights (1) are identical except for the lenses.

a. Removal.

(1) Disconnect light connector from harness connector.

(2) Remove two screws (2) and lens (3).

(3) Remove lamp (4).

(4) Remove two screws (5) and light housing (6).

(5) Push shell (7) back on wire and remove C-washer (8) and shell (7). Remove terminal (9) if damaged.

b. Installation.

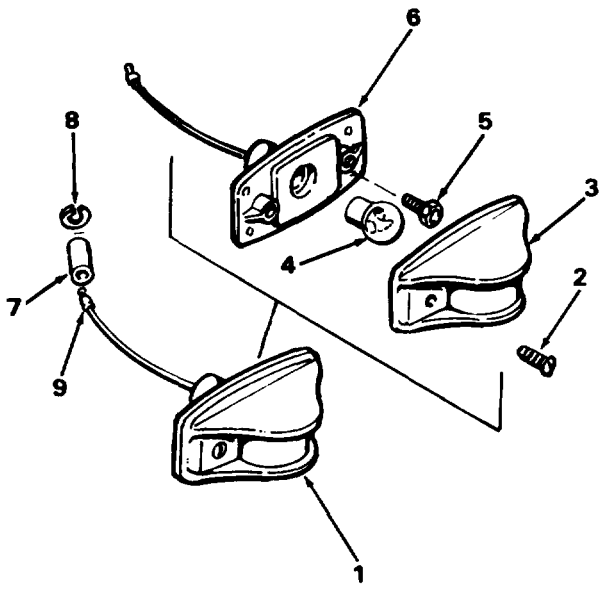
(1) Install terminal (9) if removed. Insert terminal (9) through shell (7). Install C-washer (8) on terminal (9) and pull shell (7) over terminal.

(2) Mount light housing (6) to trailer with two screws (5).

(3) Install lamp (4).

(4) Install lens (3) with two screws (2).

(5) Connect connector to wiring harness.



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4-12. TESTING ELECTRICAL SYSTEM

Materials/Tools

Multimeter

a. Check for Grounds.

(1) Disconnect all wiring connectors at the lights. Be sure identification markers are present on individual wires before disconnecting. If not, tag wires.

NOTE

Check for continuity on grounds using the multimeter on a low ohms scale.

(2) Check for continuity between wiring harness connector pin D and the chassis. If the circuit is open, repair ground lead on wiring harness.

(3) Check for grounds between wiring harness connector pins A, B, C, E, F and J and pin D (ground). (Refer to schematic diagram, page 4-2 1.) There should be an open circuit between the connectors pins. If there is continuity between any connector pin as specified, that circuit is grounded and the wiring harness must be repaired or replaced.

(4) Remove all lamps from lights (para. 4-10 and 4-11).

(5) Check for grounds from each light lead wire and the chassis (ground). There should be an open circuit between each lead wire and the chassis. If there is continuity on any lead wire, the wire is grounded and must be repaired or the light replaced.

4-12. TESTING ELECTRICAL SYSTEM (cont)

b. Check Wiring Harness Continuity.

(1) Install all lamps in lights (para. 4-10 and 4-11).

(2) Check for continuity between each light lead wire and the chassis. If there is an open circuit, first check lamp. If lamp is defective replace it. If there is still an open circuit, repair lead wire or replace light.

(3) Connect all wire connectors at lights.

(4) Check for continuity between wiring harness connector pins A, B, C, E, F and J and pin D (ground). Each circuit should indicate continuity. If not, there is a broken wire and wiring must be repaired or replaced.

c. Check Intervehicular Cable Continuity.
Check for continuity between individual connector pins and socket on opposite ends of cable at terminals A, B, C, D, E, F and J. Each circuit should indicate continuity. If any circuit is open, replace cable.

4-13. WIRING HARNESS

Materials/Tools

General mechanics tool kit
Electrical tool kit
Soldering iron
Wiping rag (item 10, app E)

NOTE
Remove complete harness only if required to effect repair or replacement.

a. Removal.

(1) Tag and disconnect harness connectors (1 and 2) at all lights.

(2) Remove tyraps (3) around harness (4) at composite light mounting bracket.

(3) Remove nuts (5) from studs (6) at 19 positions along frame securing wiring harness (4) and remove clamps (7) from harness.

(4) Remove four lock nuts (8) and cap screws (9) to free ground lead (11), connector (12) and cover (13) from frame. Remove lock washer (10).

NOTE
To make installation easier, tape connector bundles to main harness if desired.

(5) Feed wire harness (4) through grommets (14 and 15) and along frame while pulling harness through frame hole for connector (12). Continue to do this until the entire harness can be pulled out through the hole.

b. Cleaning and Inspection.

(1) Clean wiring harness with a clean rag.

(2) Inspect wiring for cuts, breaks and loose connections, and connectors and cover for damage.

c. Repair.

(1) If connector (12) is damaged, and harness is in good condition, replace connector. Unsolder individual wires from connector and re-solder wires to new connector as shown on the schematic diagram, page 4-21.

(2) If any connector terminal (1) is damaged, replace it. Push back shell (2) on wire to expose terminal (1), remove defective terminal, and crimp a new terminal on end of wire. Pull shell over terminal.

(3) If individual harness wires extending from the harness loom are broken, cut off defective piece of wire and splice on new length of wire. Install new terminal (1) and shell to new wire (step 2).

4-13. WIRING HARNESS (cont)

(4) If wire leads have damaged insulation, tape over damaged insulation where required. If wires within the harness loom are defective, replace wiring harness.

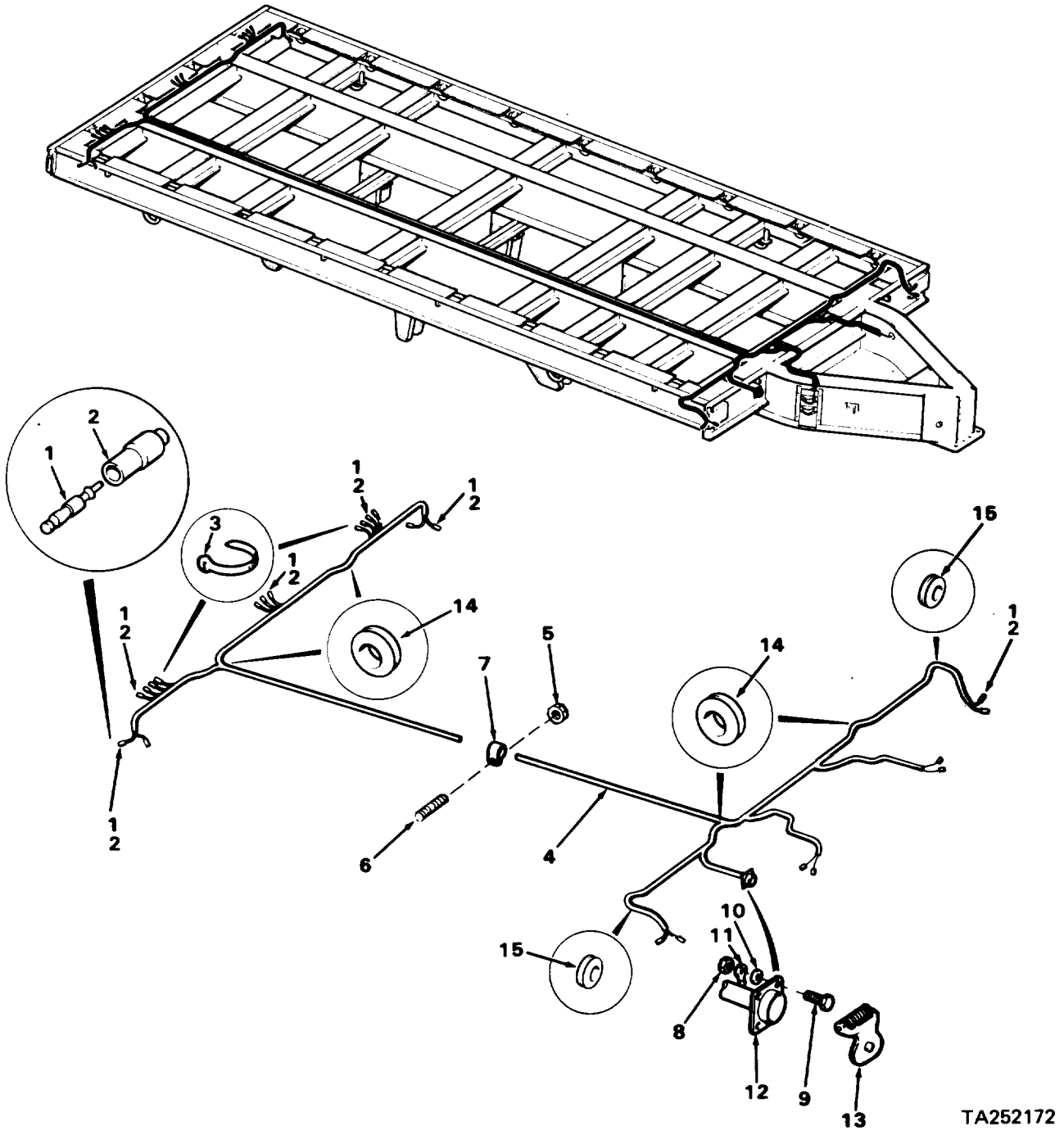
(5) Replace deteriorated grommets in frame holes.

d. Installation.

CAUTION

Do not damage wiring or insulation during installation of wiring harness.

(1) Feed wiring harness (4) through the frame hole for connector (12).



4-13. WIRING HARNESS (cont)

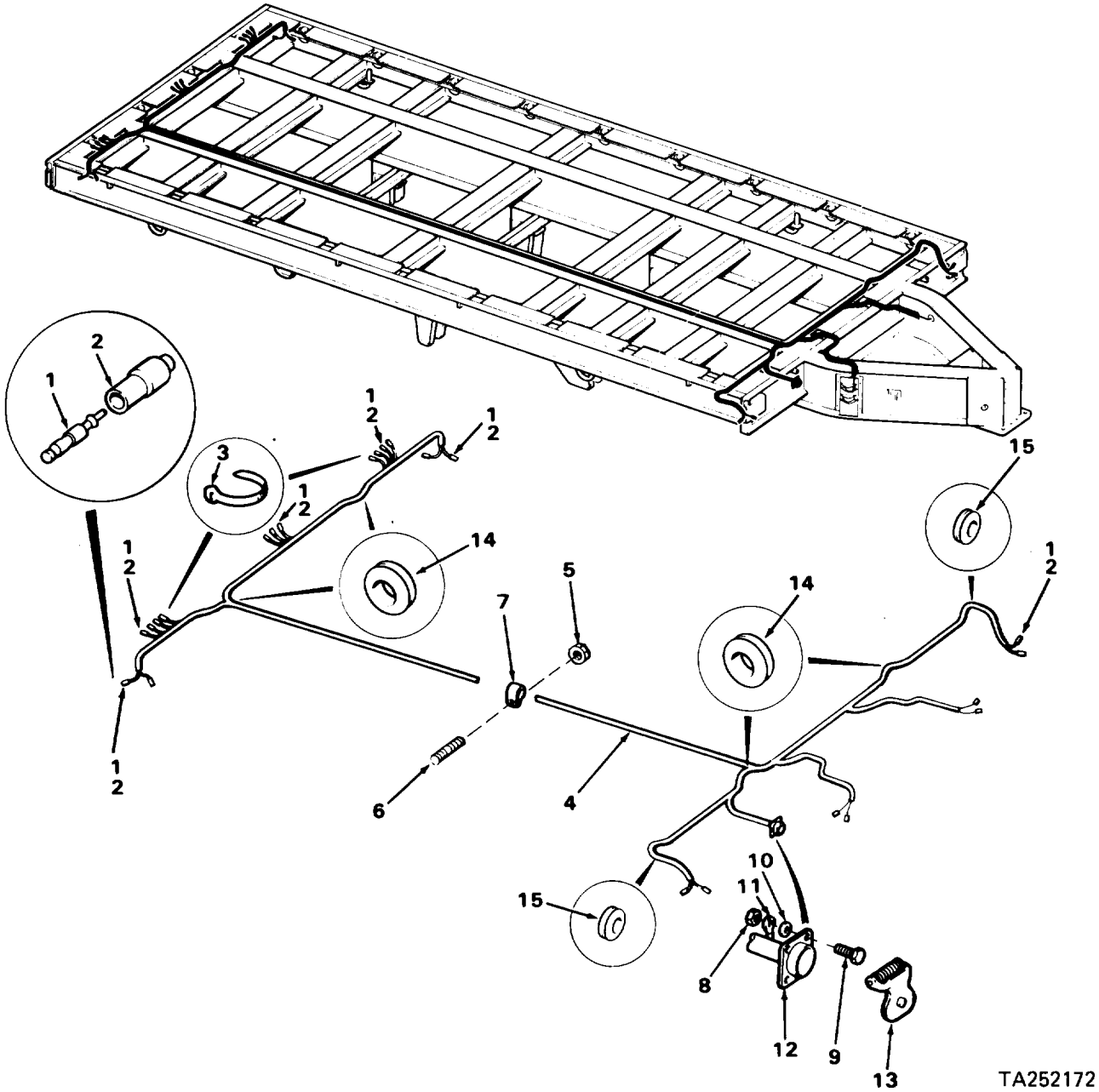
(2) Run wiring harness (4) along frame and through grommets (14 and 15) as shown. Run harness over cross beams and inside of main beam. Install clamps (7) over harness and attach to studs (6) with nuts (5) in 19 places. Run rear of harness through grommet (14) to left side.

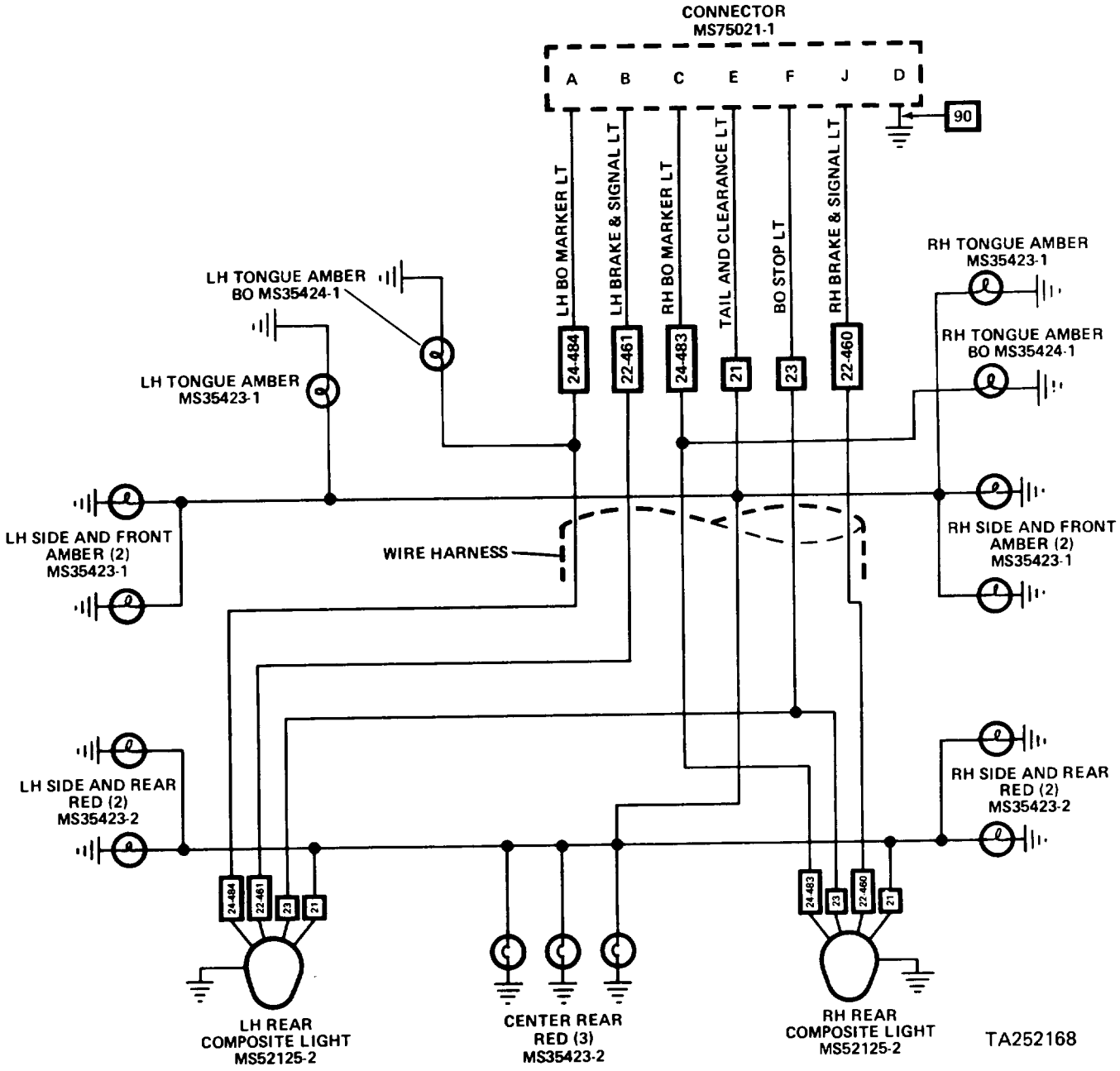
(3) Position connector (12) and cover (13) on frame. Connector must have A contact upward. Install cap screws (9) and lock nuts (8). Be sure ground lead (11) and lock washer (10) are under one of the lock nuts.

(4) Install tyraps (3) around composite light wires and mounting bracket.

(5) Connect connectors (1 and 2) to all lights.

(6) Connect HEMAT to towing vehicle and check operation of all lights.





ELECTRICAL
SCHEMATIC DIAGRAM

Section VI. MAINTENANCE OF AIR BRAKE SYSTEM

	Page		Page
Air Lines	4-30	Hubs and Drums	4-22
Air Valves	4-33	Service Brakes	4-24
Air Tanks	4-36	Brake Air Chamber	4-29

4-14. HUBS AND DRUMS

Materials/Tools

Solvent cleaning compound (Item 3, app E)
Wiping rag (Item 10, app E)
Grease GAA (Item 4, app E)
Hub cap gasket (app F)
Hub oil seal (app F)
General mechanics tool kit
Ratchet, 3/4 inch drive
Bearing nut wrench, 3/4 inch drive, 3-1/4 inch
Bearing nut wrench, 3/4 inch drive, 3-7/8 inch
Torque wrench, 3/4 inch drive, 0-600 lb-ft.
Two pry bars

a. Removal.

(1) Chock wheels.

(2) Drain air tanks.

(3) Cage air brake chamber (para. 2-27a).

(4) Remove wheel and tire (para. 3-6).

(5) Back off slack adjuster (para. 4-15c).

(6) Remove six hex bolts (1), hub cap (2) and gasket (3).

(7) Remove outer spindle nut (4) using 3-1/4 inch bearing nut wrench and ratchet. Remove spindle lock (5).

(8) Loosen inner spindle nut (6) using 3-7/8 inch bearing nut wrench and ratchet until nut is flush with outside edge of hub (7).

(9) Using two pry bars force hub-drum assembly (7 through 16) out against nut (6).

(10) Remove nut (6) and outer bearing cone (8).

(11) Remove hub-drum assembly (9 through16) as a unit and place on clean work surface with hub (7) upward.

(12) Using brass drift drive out bearing cone (9) and seal (10) and then drive out bearing cup (11).

(13) Turn unit so hub is down. Using brass drift drive out bearing cup (12).

(14) Only remove back nuts (13), washers (14) and drum (15) from hub (7) if studs (16) are damaged.

(15) Remove studs (16) from hub (7) only if damaged.

b. Cleaning.

WARNING

Solvent cleaning compound is an environmentally compliant product and is low in toxicity. However, it may be irritating to the eyes and skin due to its base stock. The use of protective gloves and goggles is required. Use the solvent cleaning compound in well-ventilated areas and keep away from open flames and other sources of ignition.

(1) Clean all parts thoroughly using a brush and solvent cleaning compound. Allow to air dry.

(2) Clean spindle (17) on axle (18) with wiping cloth.

4-14. HUBS AND DRUMS (cont)

c. Inspection.

(1) Inspect bearings visually for wear and scoring flat spots and overheating (discoloration).

(2) Inspect brake drum visually for deep coring, excessive wear (ridge) and other irregularities. Repair or replace brake drum. Notify direct support maintenance.

(3) Inspect hub cap, nuts, lock and hub for cracks and other damage.

(4) Inspect spindle for damaged threads, evidence of seizure and rough surfaces. Replace axle. Notify direct support maintenance.

d. Repair.

Repair gasket, seal and all defective parts.

e. Installation.

(1) Install studs (16) in hub (7) if removed.

(2) Install inner bearing cup (11) in hub (7), with narrow edge outward. Seat with steel drift.

(3) Pack inner bearing cone (9) with grease GAA and install in cup.

(4) To assure proper fit, place seal (10) on spindle up to first rubber rib. The correct seal will not go on any further due to designed interference.

(5) Place seal (10) on rear of hub (7) with the words "OIL SIDE" facing inward. Make sure that seal is straight. Using a hammer and piece of flat hardwood, tap the seal into hub until seal bottoms out.

(6) Install outer bearing cup (12) in hub (7). Pack hub cavity with grease GAA up to level of inside diameter of outer bearing cup (12).

(7) Install drum (15) on hub (7) with back nuts (13) and washers (14) if removed. Tighten nuts (13) to 300-330 lb-ft.

(8) Pack outer bearing cone (8) with grease GAA and install in cup (12).

NOTE

Be sure there is no brake drag between brake shoes and drum.

(9) Install inner spindle nut (6) on spindle (17) and tighten nut against bearing while turning brake drum (15) by hand. When there is a slight bind, back off inner spindle nut 1/3 turn to allow free rotation of wheel.

(10) Install spindle lock (5) and outer spindle nut (4). Tighten outer spindle nut to 250-400 lb-ft.

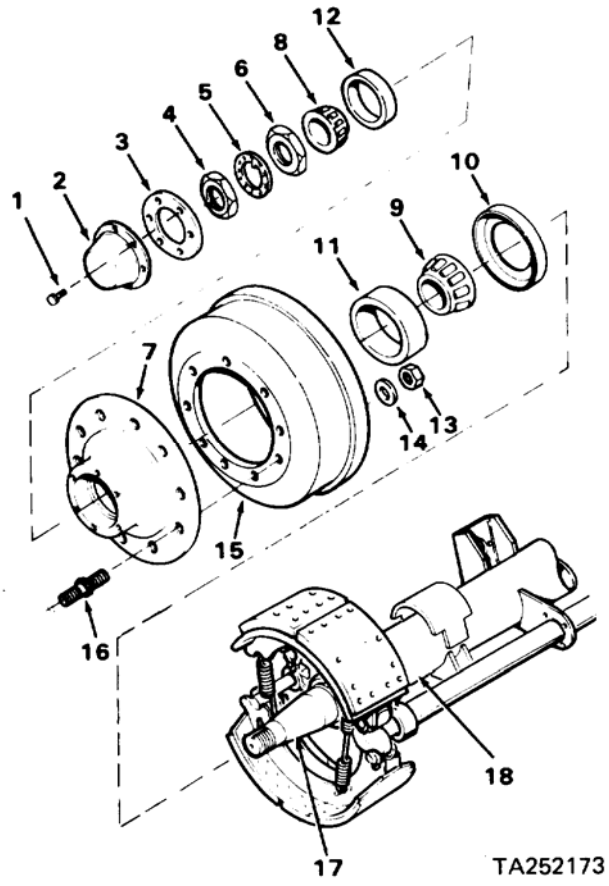
(11) Repack hub cap (2) with grease GAA.

(12) Install hub cap (2) and new gasket (3) with six hex bolts (1).

(13) Rotate brake drum (15) to assure free movement without binding.

(14) Uncage air brake chamber (para. 2-27 b).

(15) Install wheels and tires (para. 3-6).



4-14. HUBS AND DRUMS (cont)

(16) Close air tank drain cocks.

(17) Remove chocks.

(18) Adjust brakes (para. 4-15c).

(19) Lower trailer.

4-15. SERVICE BRAKES

Materials/Tools

Solvent cleaning compound (Item 3, app E)
Wiping rag (Item 10, app E)
General mechanics tool kit
Lock ring pliers
Pry bars

a. Brake Shoes.

(1) Removal.

(a) Remove wheels and tires (para. 3-6) and hubs and drum (para. 4-14a).

(b) Apply a 9/16 inch wrench to hex head (1) of worm shaft and push in against the slack adjuster (2) to un-lock the worm shaft.

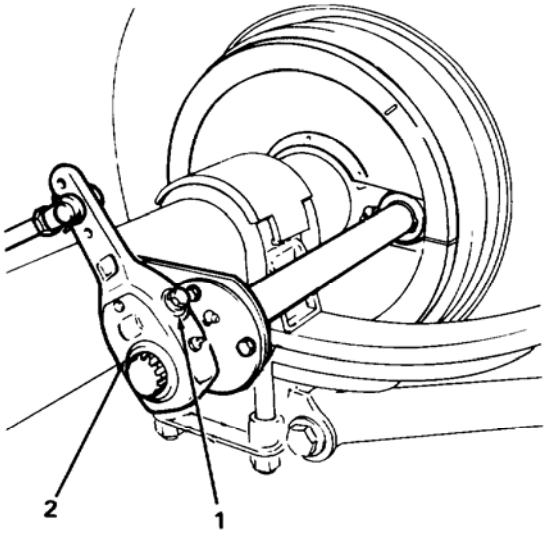
(c) Turn the hex head (1) of the worm shaft counterclockwise to back off slack adjuster to low part of cam(3).

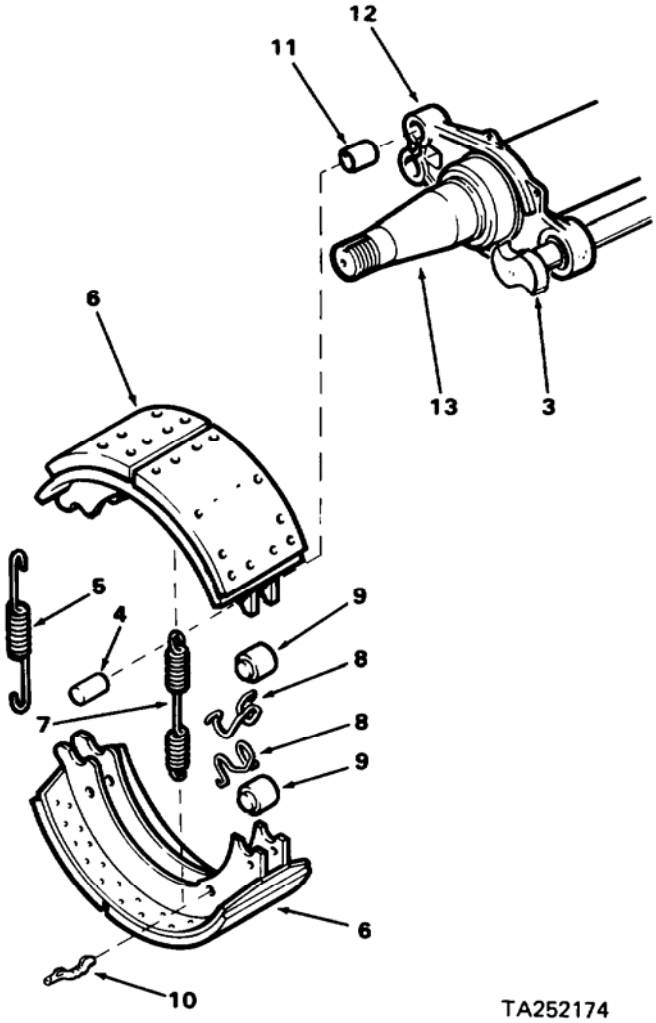
(d) Drive out brake anchor pins (4).

(e) Remove two retaining springs (5).

(f) Remove brake shoe assemblies (6) with retract springs (7), springs (8) and rollers (9).

(g) Remove retract spring (7) from brake shoe assemblies (6).





4-15. SERVICE BRAKES (cont)

(h) Remove roller retaining springs (8)and rollers (9) from brake shoe assemblies (6).

(i) Drive out spring pins (10) from brake shoe assemblies (6).

(j) Remove bushings (11) spider (12) if worn.

(2) Cleaning.

WARNING

Solvent cleaning compound is an environmentally compliant product and is low in toxicity. However, it may be irritating to the eyes and skin due to its base stock. The use of protective gloves and goggles is required. Use the solvent cleaning compound in well-ventilated areas and keep away from open flames and other sources of ignition.

CAUTION

Do not allow lubricants or solvents to get on brake shoes. These materials will do damage to brake linings and result in poor braking action.

WARNING

DO NOT use a dry brush or compressed air to clean brake shoes. There may be asbestos dust on brake shoes which can be dangerous to your health if you breath it. Dampen surface of lining with water and use a soft bristle brush.

(a) Clean all parts except brake shoes with a brush and solvent cleaning compound.

(b) Clean brake shoes with soft bristle brush.

(3) Inspection.

(a) Inspect brake shoes for wear and scoring. Replace brake shoes if linings are worn to less than 5/16-inch thick at any place on the linings.

(b) Inspect springs for kinks, corrosion and distortion.

(c) Inspect rollers, anchor pins, spring pins and bushings for wear, corrosion and other damage.

(a) Using brass drift drive out bearing cone (9) and seal (10) and then drive out bearing cup (11).

(4) Repair.

Replace all defective parts.

(5) Installation of Brake Shoes.

(a) Install bushings (11) in axle spider (12) if removed.

(b) Drive spring pins (9) into brake shoe assemblies (6).

(c) Install rollers (9) on brake shoe assemblies (6) and secure with retaining springs (8).

(d) Install retract spring (7) on spring pins (9) on brake shoe assemblies (6).

(e) Position brake shoe assemblies (6) with springs (7 and 9) and rollers so rollers engage cam (3) and shoes straddle spindle (13)

(f) Install two retaining springs (5) on brake shoe assemblies (6)

(g) Pry up upper brake shoe assembly (6) and insert anchor pin (4) in upper bushing (11).

(h) Pry down lower brake shoe assembly (6) and insert anchor pin (4) in lower bushing (11).

(i) Install hubs and drums (para. 4-14e).

(j) Install wheels and tires (para. 3-6).

(k) Adjust brakes (para. 4-15c).

4-15. SERVICE BRAKES (cont)

b. Camshaft and Bearings.

(1) Removal.

(a) Chock wheels.

(b) Cage air brake chamber (para. 2-27 a).

(c) Drain air tanks.

(d) Remove wheels and tires (para. 3-6).

(e) Remove hubs and drum (para. 4-14a, steps 1 through 4).

(f) Remove brake shoes (para. 4-15a (1)).

(g) Remove lock ring (1) and slack adjuster (2) (para. 4-15d (1)).

(h) Remove lock ring (4) using lock ring pliers. Withdraw camshaft (3) part way and remove washer (5).

(i) Remove three hex nuts (6), lock washers (7) and screws (8) to remove bearing assembly (9).

(j) Remove grease fitting (10).

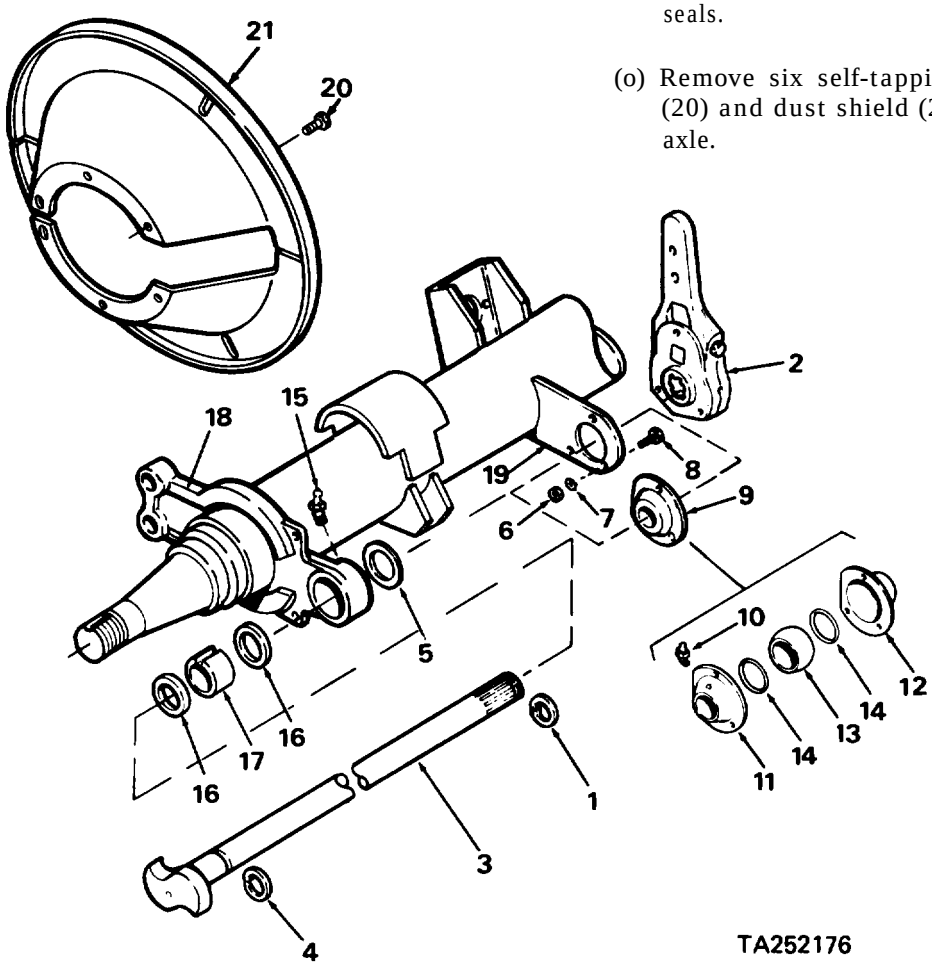
(k) Separate brackets (11 and 12) and remove bearing (13).

(l) Remove seals (14) from brackets and discard seals.

(m) Remove grease fitting (15).

(n) Remove seals (16) and bushing (17) from axle spider (18). Discard seals.

(o) Remove six self-tapping screws (20) and dust shield (21) from axle.



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4-15. SERVICE BRAKES (cont)

(2) Installation.

(a) Install bushing (17) in spider (18). Make sure hole in bushing alines with hole in spider for grease fitting (15).

(b) Install new seals (16) and grease fitting (15).

(c) Install new seals (14) in brackets (11 and 12).

(d) Place bearing (13) between brackets (11 and 12) so hole in bearing alines with hole in bracket (11). Insert grease fitting (10) through bracket hole and install in bearing,

(e) Install bearing assembly (9) on axle bracket (19) with three screws (8), lock washers (7) and hex nuts (6).

(f) Coat length of camshaft (3) with grease GAA and insert through bushing (17). Place washer (5) on camshaft and insert camshaft through bearing assembly (9).

(g) Install lock ring (4) using lock ring pliers.

(h) Install slack adjuster and lock ring (para. 4-15d (2)).

(i) Install brake shoes (para. 4-15a (5)).

NOTE

It may be necessary to remove slack adjuster to aline camshaft with shoe anchor pins.

(j) Install hubs and drums (para. 4-14 e).

(k) Install wheels (para. 3-6).

(l) Install dust shield (21) with six self-tapping screws (20) after brake adjustment (para. 4-15c).

c. Brake Adjustment (Slack Adjustment).

NOTE

Brake adjustment must be done with brake air chambers uncaged, air in the system and dust shield removed.

(1) Jack up wheel to be adjusted (para. 3-6).

(2) Apply a 9/16 inch wrench to hex head (1) of worm shaft and push in against the slack adjuster (2) to unlock the worm shaft.

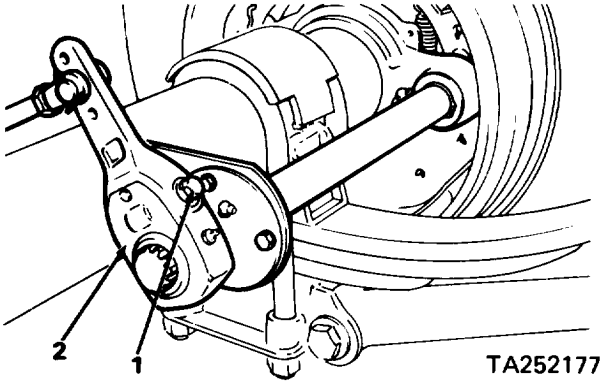
(3) Turn the hex head (1) of the worm shaft clockwise on slack adjuster until the wheel cannot be turned.

(4) Back off the worm shaft hex head (1) until the wheel turns freely. Check clearance between brake shoes and drum with feeler gage. Clearance should be 0.005 inch. Adjust worm shaft hex head (1) to meet specified clearance.

(5) Lower jack and remove from axle (para. 3-6).

(6) Repeat steps (1) through (5) for other slack adjusters as required.

(7) Install dust shield (para. 4-15b2).



4-15. SERVICE BRAKES (cont)

d. Slack Adjusters.

(1) Removal.

(a) Chock wheels.

(b) Cage air brake chamber (para. 2-27 a).

(c) Drain air tanks.

(d) Remove cotter pin (1) and headed pin (2) from rod end (3).

(e) Remove lock ring (4) with lock ring pliers. Remove slack adjuster (5) from camshaft (6). Pull slack adjuster arm away from push rod end to clear. Use soft-faced hammer to tap slack adjuster off if necessary.

(2) Installation.

(a) Install slack adjuster (5) on camshaft (6). Turn camshaft to aline slack adjuster with push rod end. Use soft-faced hammer to tap in place if necessary.

NOTE

The center hole of the three holes on the slack adjuster must be alined with push rod end. If it is not, reinstall slack adjuster.

(b) Install lock ring (4) on camshaft (6) using lock ring pliers.

(c) Install headed pin (2) through center hole of slack adjuster (5) and push rod end (3).

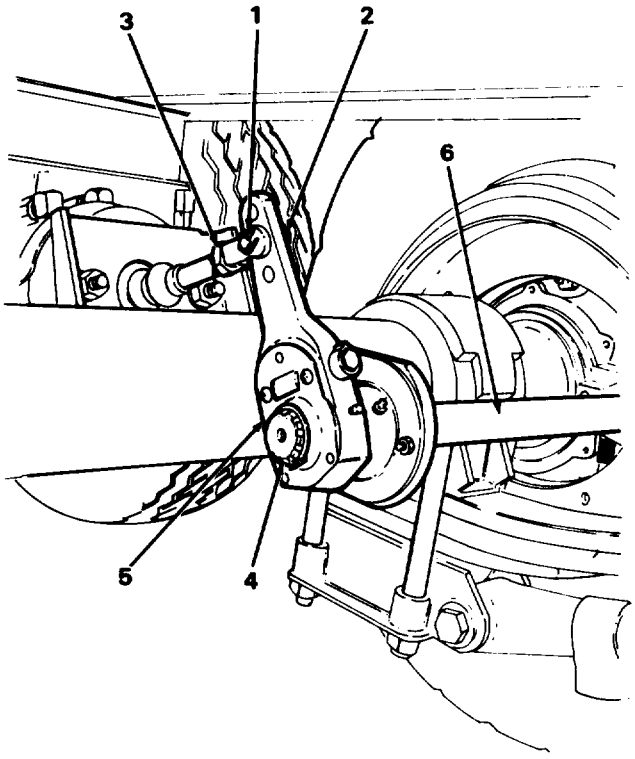
(d) Install cotter pin (1) in pin (2).

(e) Lubricate slack adjuster with grease-GAA.

(f) Uncage air chambers (para. 2-27b).

(g) Close air tank drain cocks.

(h) Adjust brakes (para. 4-15c).



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4-16. BRAKE AIR CHAMBER

Materials/Tools

General mechanics tool kit

WARNING

Do not attempt to disassemble the brake air chamber. The springs inside the chamber are under heavy tension and may cause severe injury if released during disassembly,

a. Removal.

(1) Cage air chambers (para. 2-27a).

(2) Drain air tanks.

(3) Tag and disconnect air hoses (1 and 2) fro-m brake air chamber (3).

(4) Remove cotter pin (4) and headed pin (5).

(5) Remove two hex nuts (6) and lock washers (7). Withdraw brake air chamber (3).

(6) Remove elbows (8).

(7) Loosen nut (9) and remove clevis (10) and nut from push rod.

(8) Remove plate (11) and boot (12) from air chamber,

(9) Uncage air chamber (para. 2-27b).

b. Installation.

(1) Install boot (12) and plate (11) on air chamber.

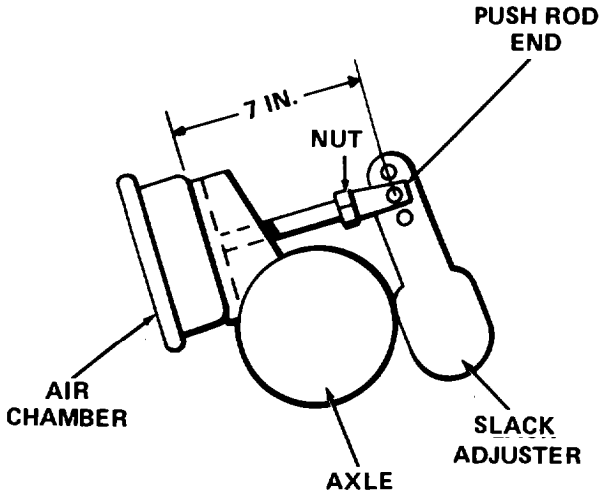
(2) Install nut (9) and clevis (10) on push rod.

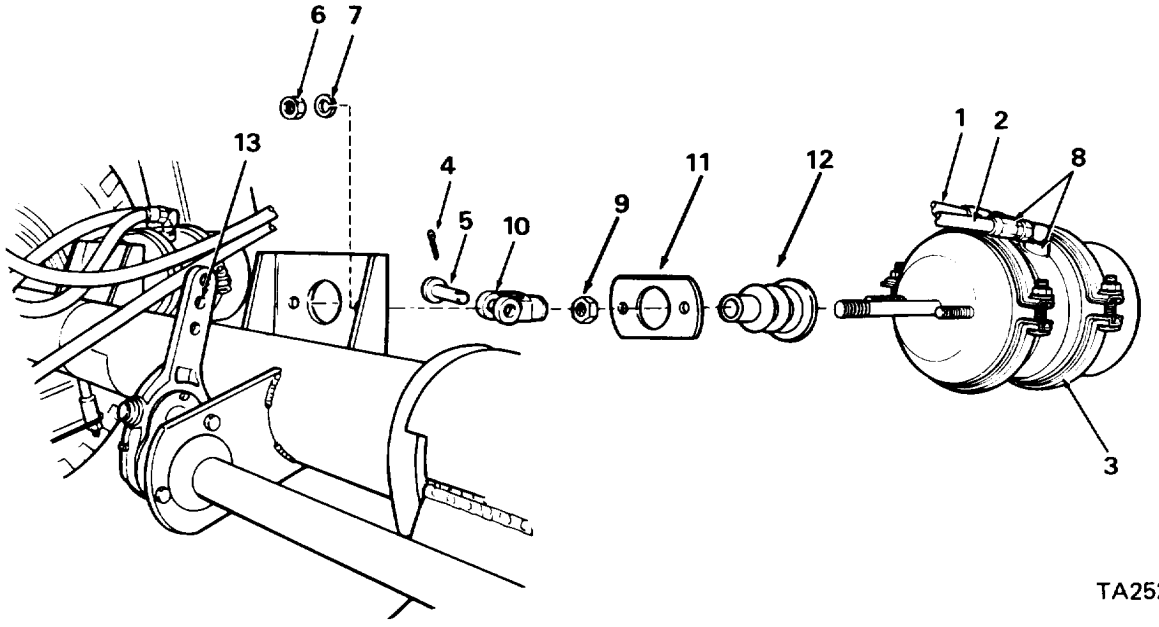
(3) Cage new brake chamber (para. 2-27a).

(4) Install elbows (8).

(5) With brake air chamber spring caged, measure length of push rod. Length should be 7 inches.

(6) If push rod length is not 7 inches, loosen hex nut and turn push rod end on or off push rod to adjust length. Tighten hex nut against push rod end to 15-25 lb-ft.





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4-16. BRAKE AIR CHAMBER (cont)

(7) Mount air chamber (3) with two hex nuts (6) and lock washers (7).

NOTE
It may be necessary to turn slack adjuster adjustment screw to adjust chamber push rod.

(8) Align rod end (10) with center hole in slack adjuster (13). Install headed pin (5) and cotter pin (4).

(9) Uncage brake air chamber spring (para. 2-27 b).

(10) Connect air hoses (1 and 2).

(11) Adjust brakes (para. 4-15c).

4-17. AIR LINES

Materials/Tools

Anti-seize tape (item 12, app E)
General mechanics tool kit

a. Removal of Air Hoses and Fittings.

NOTE
Tag all hoses before disconnecting.

(1) Remove intervehicular air hoses (1) and gladhands (2) from drawbar. Remove packing (3) from gladhands.

(2) Remove hoses (4 and 5) from air chambers (6), trailer valve (7) and relay valve (8).

(3) Remove elbows (9) from air chambers (6).

(4) Remove elbows (10) from trailer valve (7).

(5) Remove drain cocks (11) from air tanks (12).

b. Installation of Air Hoses and Fittings.

(1) Install drain cocks (11) in air tanks (12).

(2) Install elbows (10) in trailer valve (7).

(3) Install elbows (9) in air chambers (6).

(4) Connect hoses (4 and 5) to air chambers (6), trailer valve (7) and relay valve (8).

(5) Install packings (3) in gladhands (2).

(6) Connect gladhands (2) to intervehicular air hoses (1).

(7) Connect air hoses (1) to drawbar couplings.

c. Removal of Tubing and Fittings.

NOTE
Tag all air lines before disconnecting.

(1) Remove 5 wire clips (1) and 14 wire clips (2) as required.

(2) Remove tube and nut assemblies (3 through 8) from relay valve (9), trailer valve (10), parking brake control (11) and air tanks (12).

(3) Remove elbows (13, 14 and 15).

(4) Remove connectors (16 and 17) and elbows (18).

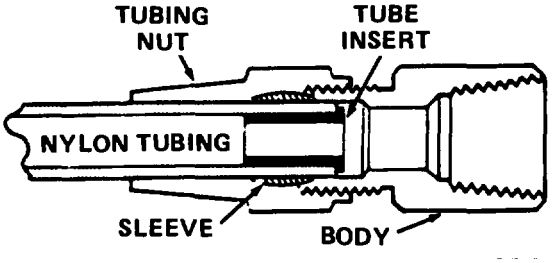
(5) Remove relay valve (9) and reducer (19).

d. Repair of Tube and Nut Assemblies.

(1) Unscrew tubing nut from body and remove body.

(2) Remove tube insert from inside of nylon tubing.

(3) Remove tubing nut and sleeve from nylon tubing.



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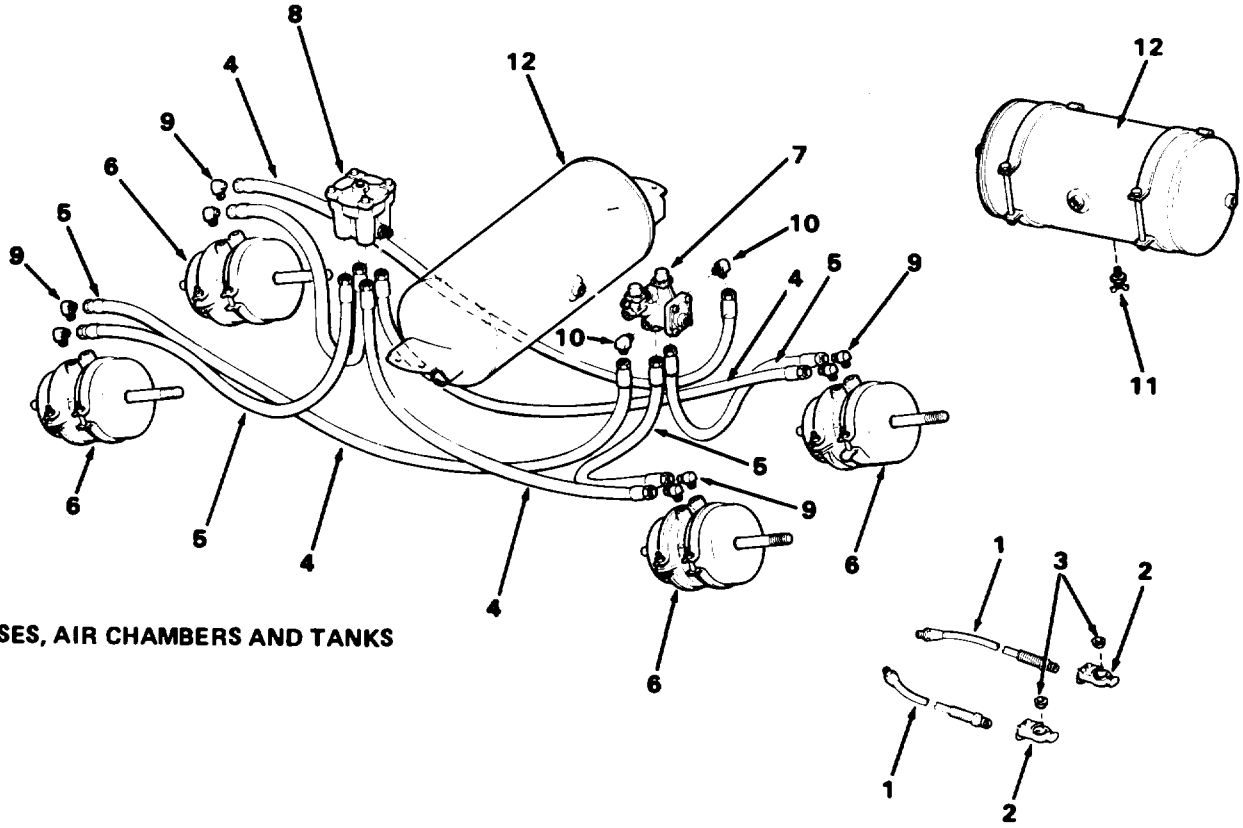
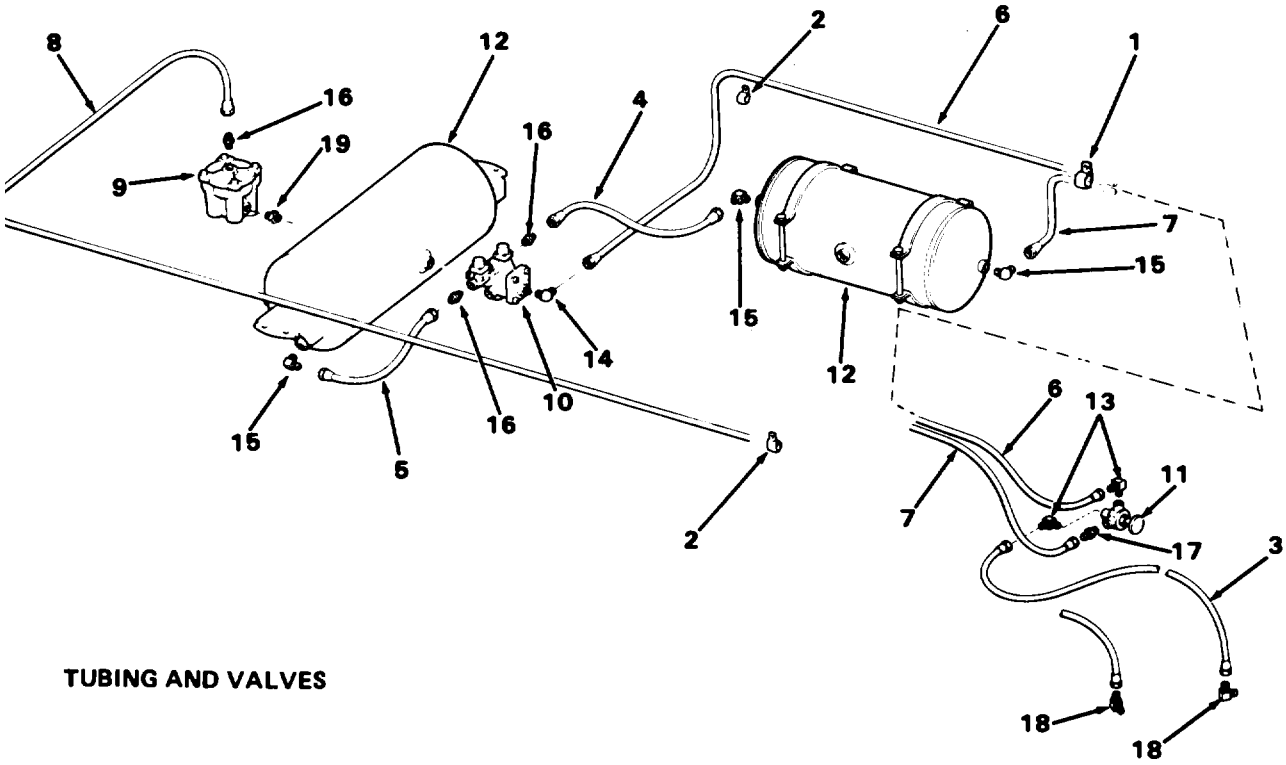


HOSES, AIR CHAMBERS AND TANKS



TUBING AND VALVES

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4-17. AIR LINES (cont)

(4) Cut nylon tubing to length as listed below:

Tube and Nut Assembly	Length of Tubing
3	60 inches
4	24 inches
5	12 inches
6	155 inches
7	98 inches
8	206 inches

(5) Place tubing nut on nylon tubing and install compression sleeve.

(6) Install tube insert in tubing so insert bottoms out in tubing.

(7) Place body over end of tubing and insert and tighten tubing nut.

e. Installation of Tubing and Fittings.

NOTE
Use anti-seize tape on all pipe threads.

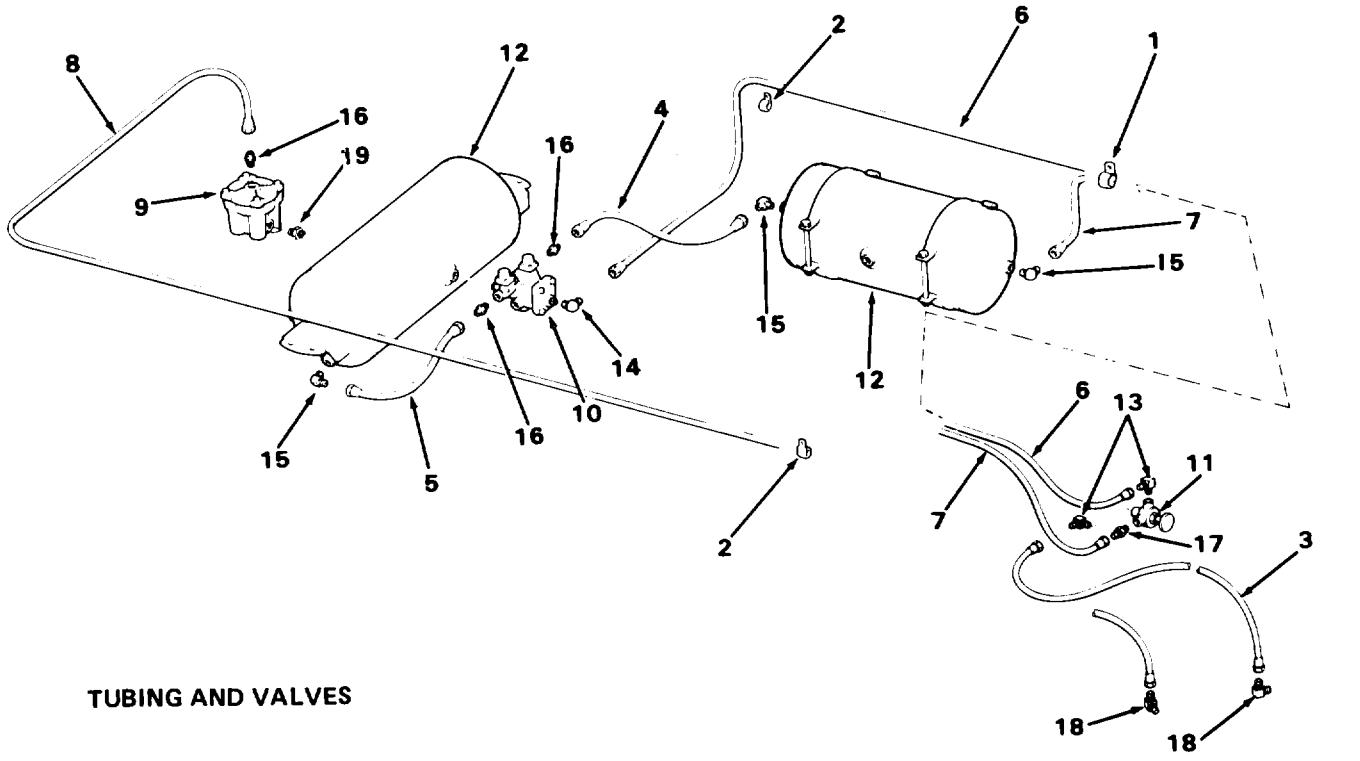
(1) Install reducer (19) and relay valve (9).

(2) Install connectors (16 and 17).

(3) Install elbows (13, 14, 15 and 18).

(4) Connect tube and nut assemblies (3 through 8) to relay valve (9), trailer valve (10), parking brake control (11) and air tanks (12).

(5) Install wire clips (1 and 2).



TUBING AND VALVES

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4-18. AIR VALVAE

Materials/Tools

Anti-seize tape (item 12, app E)
General mechanics tool kit

a. Relay Valve.

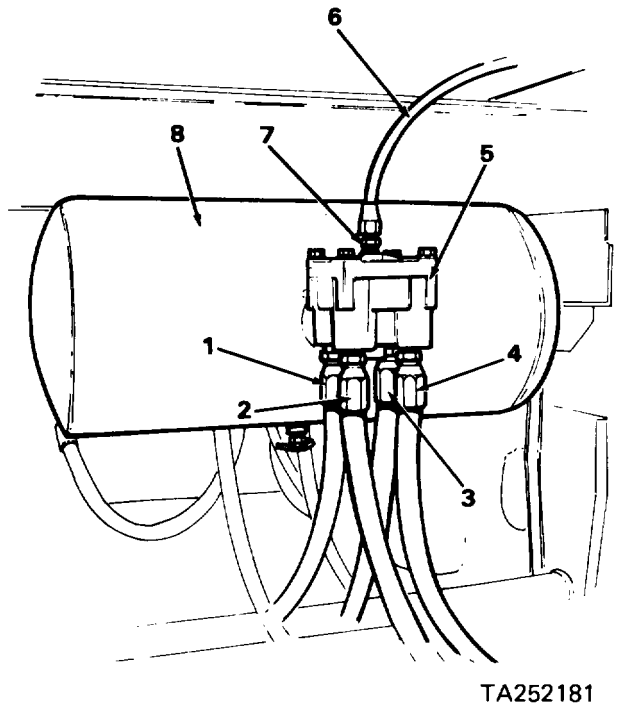
(1) Removal.

(a) Drain air tanks.

(b) Tag and disconnect four hoses (1 through 4) from relay valve (5).

(c) Disconnect tube and nut assembly (6). Remove connector (7).

(d) Turn relay valve (5) counterclockwise to remove from tank (8).



(2) Installation.

NOTE
Use anti-seize tape on all pipe fittings.

(a) Position relay valve (5) on nipple on tank (8). Turn clockwise to install. The valve must be vertical and the joint tight.

(b) Install connector (7) on relay valve (5). Connect tube and nut assembly (6) to connector making sure compression insert bottoms in connector.

(c) Install four hoses (1 through 4).

4-18. AIR VALVES (cont)

b. Trailer Valve.

(1) Removal.

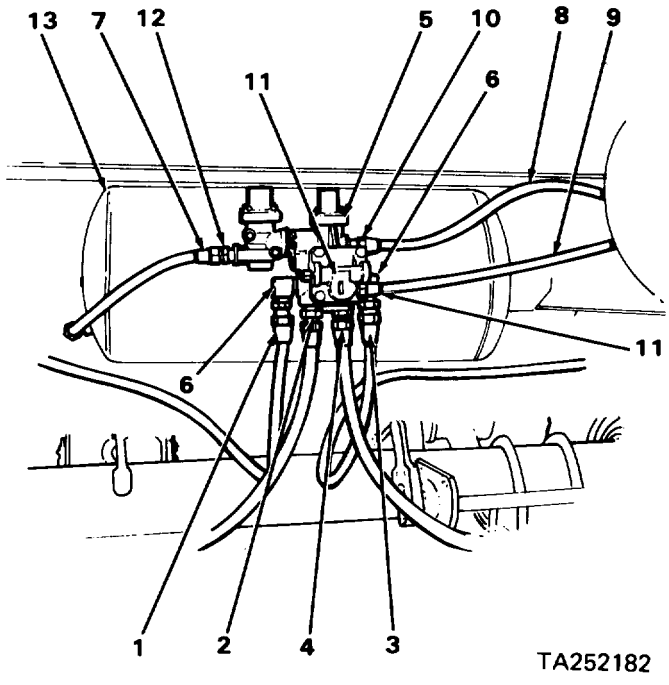
(a) Drain air tanks.

(b) Tag and disconnect hoses (1 through 4) from trailer valve (5).

(c) Remove two elbows (6).

(d) Disconnect three tube and nut assemblies (7, 8 and 9). Remove connectors (10, 11 and 12).

(e) Turn trailer valve (5) counterclockwise to remove from tank (13).



(2) Installation.

NOTE

Use anti-seize tape on all pipe fittings.

(a) Position trailer valve (5) on tank (13) and turn clockwise to install. The valve must be vertical and the joint tight.

(b) Install connectors (10, 11 and 12) on valve. Connect tube and nut assemblies (7, 8 and 9) making sure compression inserts bottom in connectors.

(c) Install two elbows (6).

(d) Install four hoses (1 through 4).

4-18. AIR VALVES (cont)

c. Parking Brake Control.

(1) Removal.

(a) Drain air tanks.

(b) Tag and disconnect tube and nut assemblies (1, 2 and 3). Remove two elbows (4) and connector (5) from parking brake control (6).

(c) Drive out roll pin in knob (7) and pull off knob.

(d) Remove hex nut (8). Withdraw control (6) from inside storage box.

(2) Installation.

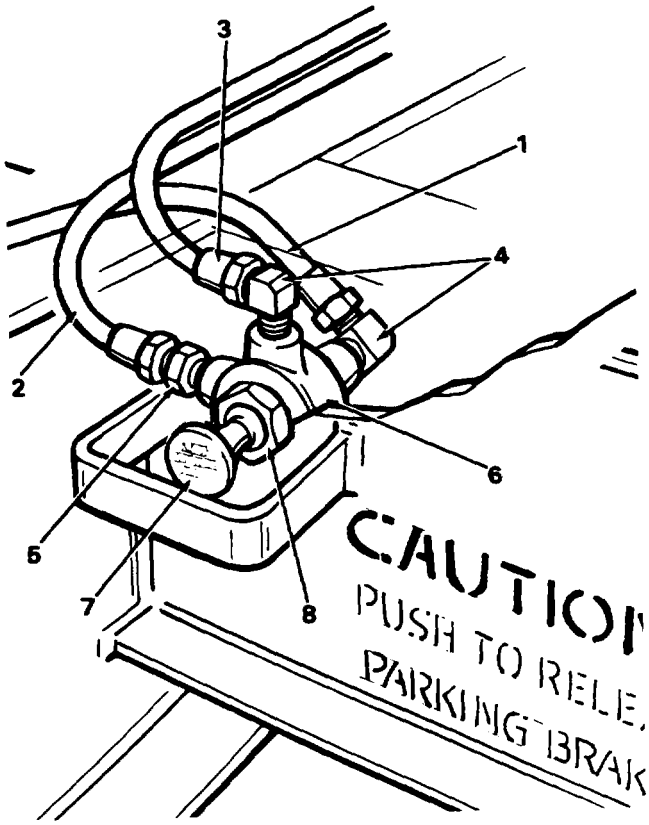
(a) Place parking brake control (6) into hole in frame. Install hex nut (8).

(b) Place knob (7) on control shaft and install roll pin to secure.

(c) Install elbows (4) and connector (5) on parking brake control (6).

(d) Connect tube and nut assemblies (1, 2 and 3) making sure compression inserts bottom in elbows and connector.

(e) Close air tank drain cocks.



4-19. AIR VALVBES (cont)

Materials/Tools

General mechanics tool kit

a. Removal.

(1) Disconnect all hoses (para. 4-1 7a) and air lines (para. 4-17c) to air tanks (1 and 2).

(2) Remove relay valve (para. 4-18a) and trailer valve (para. 4- 18b).

(3) Remove drain cocks (3).

(4) Remove four lock nuts (4) and capscrews (5) from ends of main air tank (1). Remove air tank.

(5) Support reserve air tank (2) and remove four lock nuts (6) and capscrews (7) to free air tank and brackets (8). Remove tank and brackets.

(6) Loosen brackets (8) and slide off air tank (2).

b. Installation.

(1) Install two brackets (8) on reserve air tank (2). Do not tighten.

(2) Position air tank (2) with brackets on frame so bracket mounting holes are alined with holes in frame.

(3) Install four cap screws (7) and lock nuts (6) to mount tank and brackets.

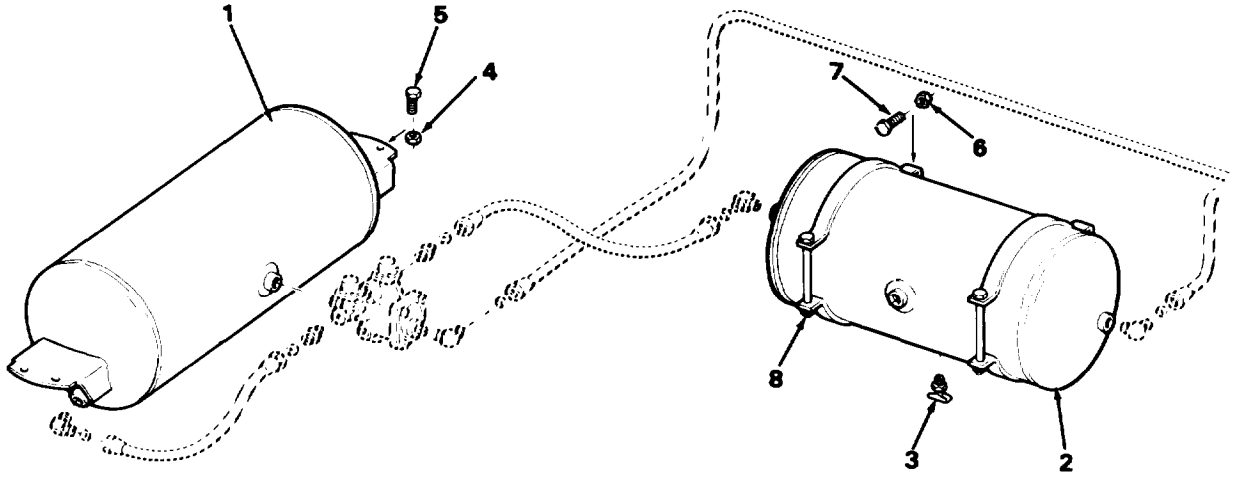
(4) Tighten clamping hardware on brackets (8) to secure tank.

(5) Position main air tank (1) on frame and install four cap screws (5) and lock nuts (4) to secure.

(6) Install relay valve (para. 4-18a) and trailer valve (para. 4-18b).

(7) Install drain cocks (3).

(8) Connect all hoses (para. 4-17b) and air lines (para. 4- 17e) to air tanks.



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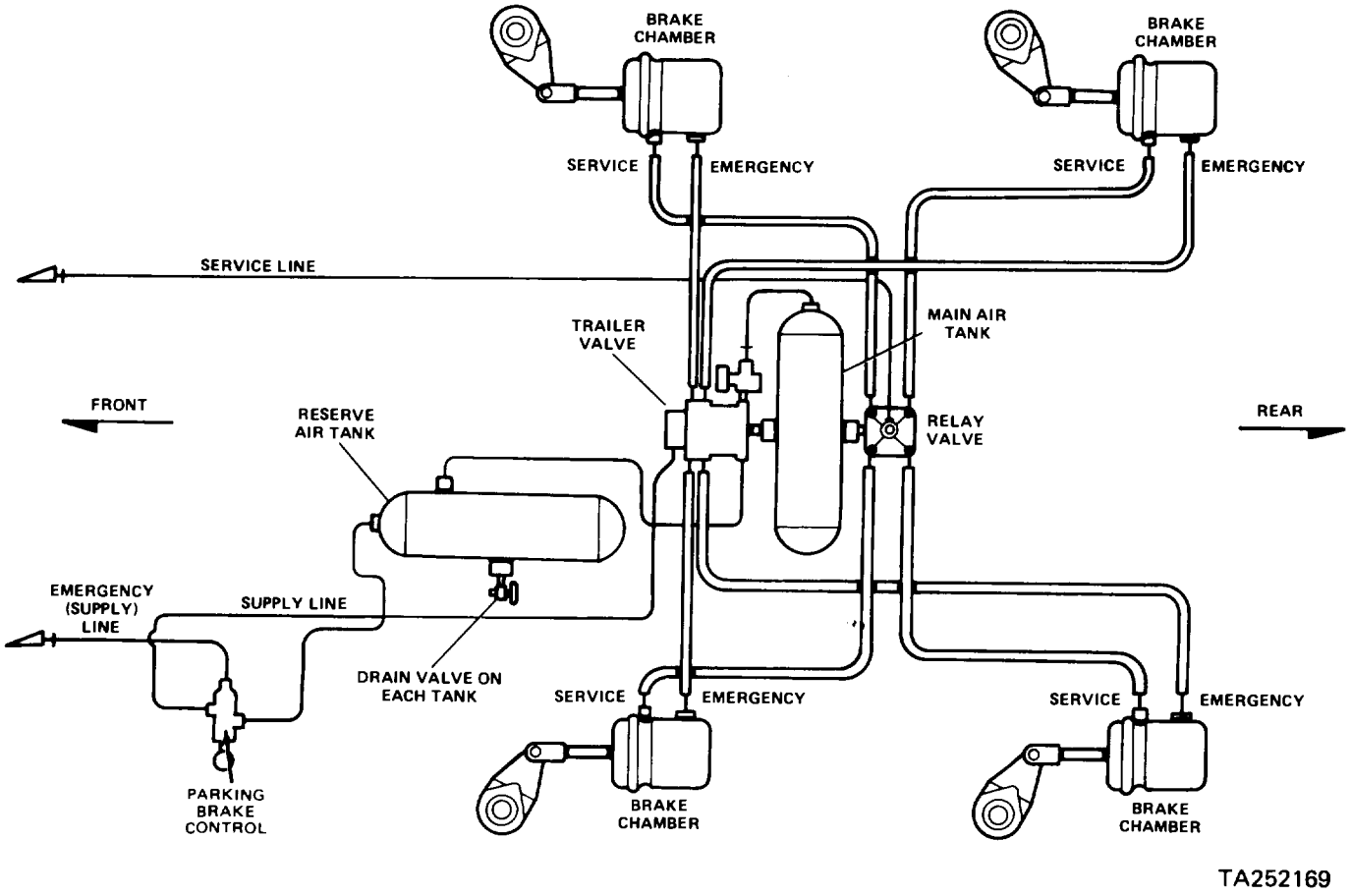


AIR SYSTEM
DIAGRAM

Section VII. MAINTENANCE OF WHEELS AND TIRES

	Page
Tire Dismounting	4-38
Tire Cleaning and Inspection	4-42
Tire Repair	443
Tire Mounting	443

4-20. TIRE DISMOUNTING

Materials/Tools

Tire and rim lubricant (item 5, app E)
Wiping rag (item 10, app E)
Tire irons T47A (reference 7, app B, section III)
Tire iron T46B (reference 8, app B, section III)
Locking jaw pliers (reference 9, app B, section III)
Bead breaking chisel
3 lb. cross peen hammer
Tire mounting pedestal, part number EX-1002 (refer to app G)

Tire dismounting is a three person operation.

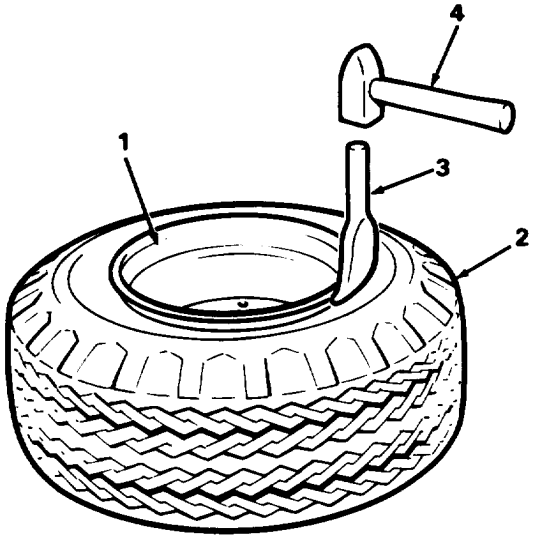
WARNING

Do not attempt to dismount tire until tire has been completely deflated. When released suddenly air under pressure can cause serious injury.

a. Deflate tire completely by removing valve core with core remover.

b. Place wheel (1) and tire (2) on flat surface. Hold bead breaking chisel (3) on bead next to rim of wheel and hammer the chisel until bead breaks away from rim. Continue to move chisel around circumference of rim until the bead is completely free. One person should hold the chisel and a second person use the hammer (4).

c. Turn wheel and tire over and repeat step b to free second bead from wheel.

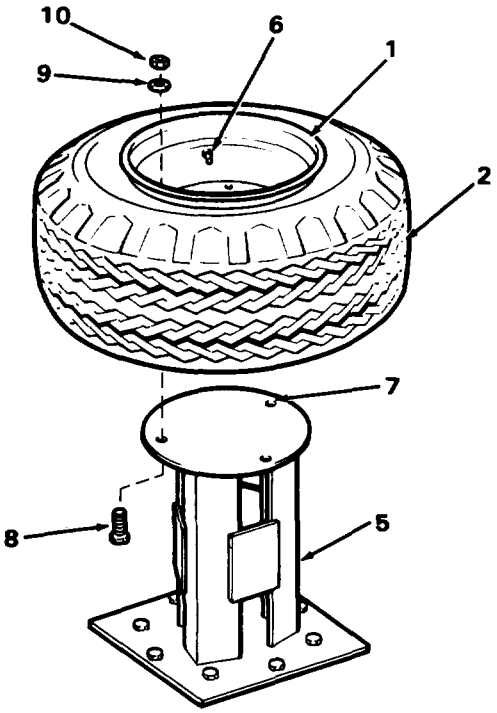


4-20. TIRE DISMOUNTING (cont)

d. Place wheel (1) and tire (2) on pedestal (5) with valve stem (6) upward. Position wheel and tire so three holes (7) in top of pedestal are alined with wheel mounting holes.

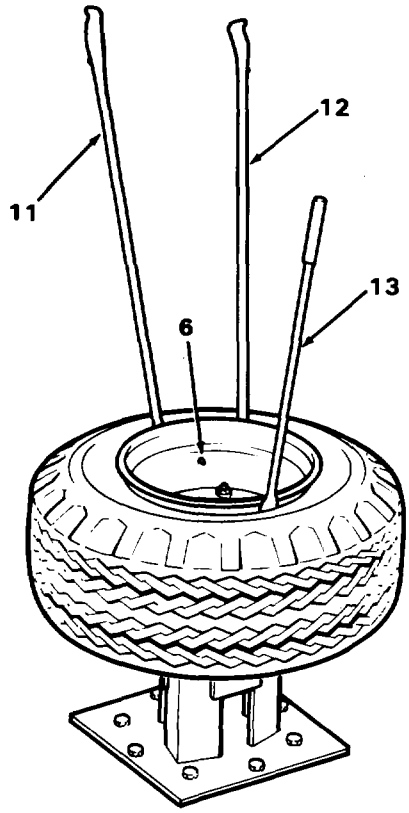
e. Install three hex bolts (8), flat washers (9) and hex nuts (10) to secure wheel and tire to pedestal (5). Mounting hardware is supplied with pedestal.

f. Apply tire and rim lubricant to bead all around circumference.



g. Insert straight ends of long tire irons (11 and 12) between bead and rim approximately 6 inches on each side of stem (6).

h. Hold long tire irons (11 and 12) in position and insert short tire iron (13) between bead and rim on side directly opposite stem (6).



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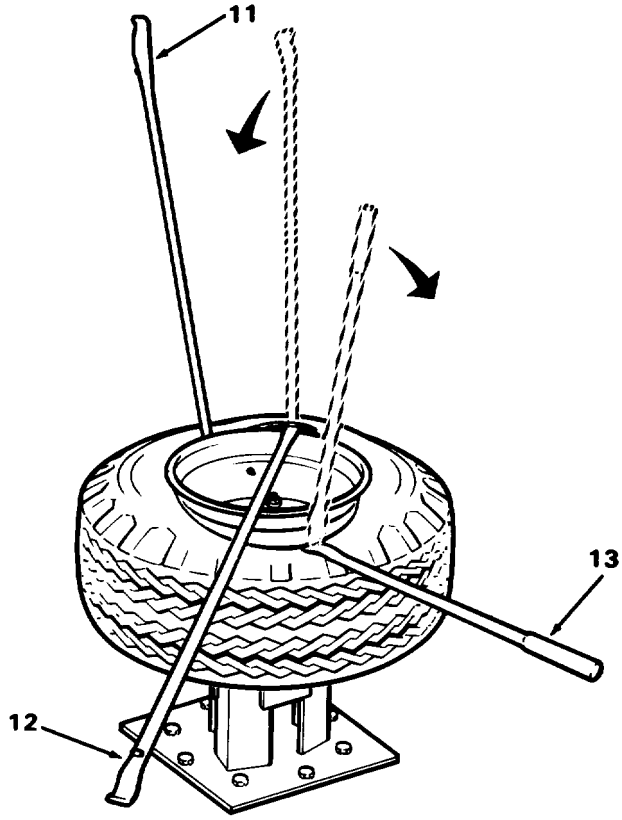
4-20. TIRE DISMOUNTING (cont)

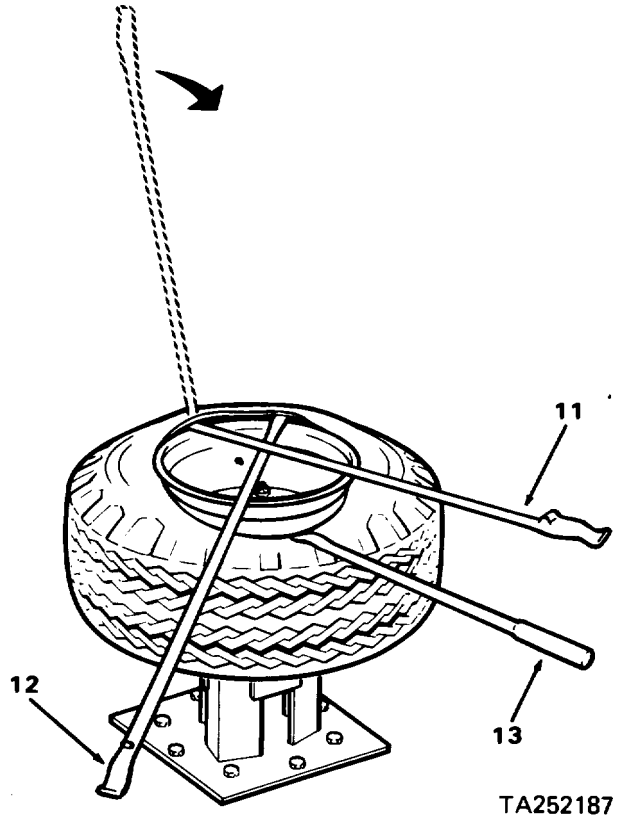
i. Lever short tire iron (13) down and hold in position to separate bead from rim and guide tire bead into groove in wheel during tire removal.

j. With one person holding short tire iron (13) down and another person holding long tire iron (i1) up, lever other long tire iron (12) down across wheel and tire to raise bead over rim.



k. With one person holding tire irons (12 and 13) down, lever long tire iron (11) down across wheel and tire to raise more of bead over rim and hold in place. Two persons are needed to lever tire iron (11) down.

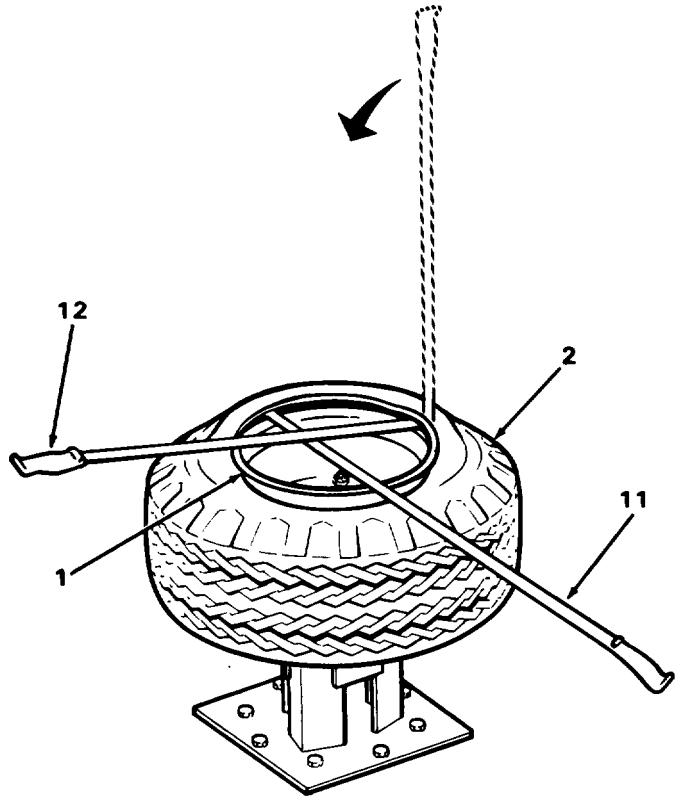
l. Remove short tire iron (13).



4-20. TIRE DISMOUNTING (cont)

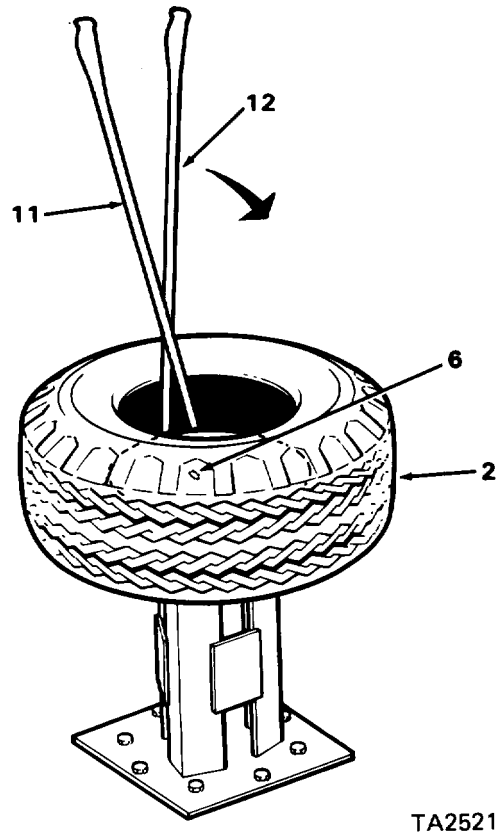
m. Hold tire iron (11) down and remove tire iron (12). Insert tire iron (12) between bead and rim at another position on rim to take another small bite of bead. Continue to hold tire iron (11) down and lever tire iron (12) down across wheel (1) and tire (2) to raise more of bead over rim.

n. Remove either tire iron (11 or 12) and repeat step m until bead is completely free of rim. Remove both tire irons.



o. Apply tire and rim lubricant to lower tire bead.

p. Insert straight end of long tire irons (11 and 12) between lower bead and rim approximately 1 inch on each side of stem (6). Scissors cross tire iron (11 and 12) and lever down across tire (2).



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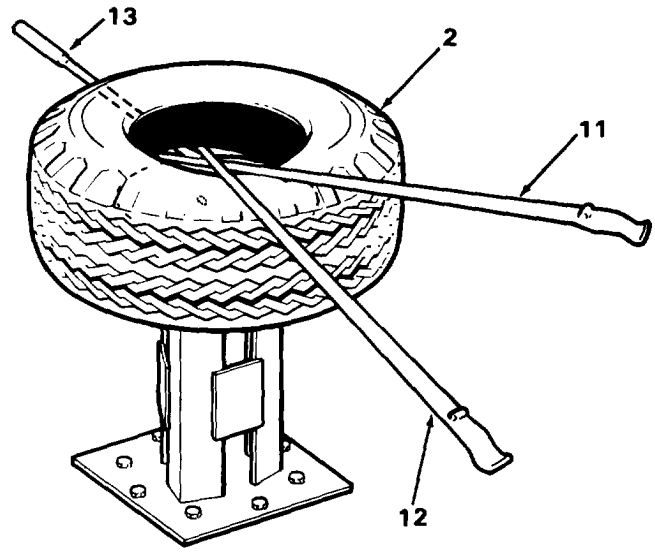
4-20. TIRE DISMOUNTING (cont)

q. Bear down on long tire irons (11 and 12) to raise lower bead above rim. Insert short tire iron (13) from underneath between long tire irons. Lever short tire iron up and bear down on long tire irons to separate lower bead from rim.

r. Remove tire irons (11, 12 and 13) and tire (2).

s. Remove nut and washer securing valve stem in wheel and remove valve stem.



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4-21. TIRE CLEANING AND INSPECTION

Materials/Tools

Wiping rag (item 10, app E)
Stiff bristle brush

a. Cleaning.

(1) Remove all buildup of dirt, grease and foreign material from wheel using a stiff bristle brush.

(2) Remove all foreign material from inside of tire. Clean bead area with a stiff bristle brush.

b. Inspection.

(1) Wheels. Inspect wheels for cracks, dents, deformed lug bolt holes, rust, corrosion, marred paint, and distortion.

CAUTION
If mounting face of wheel is not flat or ball seats are damaged, do not put wheel in service.

(2) Tires. Inspect tires in accordance with TM9-2610-200-24.

4-22. TIRE REPAIR

a. Repair tires in accordance with TM-9-2610-200-24.

b. Replace defective rims.

4-23. TIRE MOUNTING

Materials/Tools

Tire and rim lubricant (item 5, app E)
Wiping rag (item 10, app E)
Tire irons T47A (reference 7, app B, section III)
Tire iron T46B (reference 8, app B, section III)
Locking jaw pliers (reference 9, app B, section III)
3 lb. cross peen hammer
Tire mounting pedestal, part number EX-1002 (refer to app G)

CAUTION

If mounting face of wheel is not flat or ball seats are damaged, do not put wheel in service.

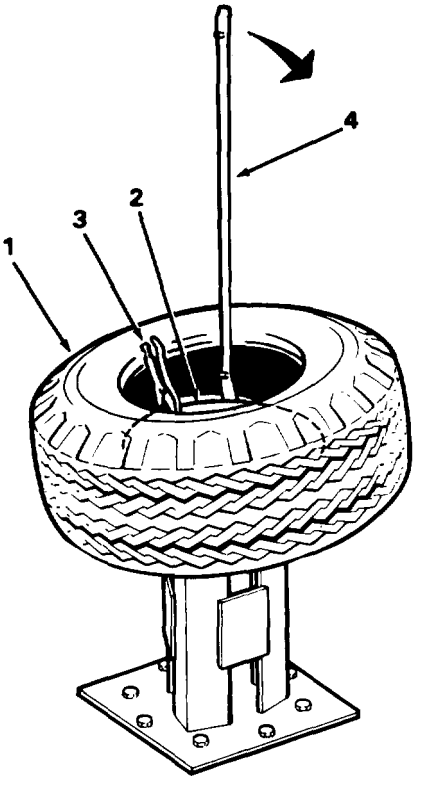
Tire mounting is a three-person operation.

a. Remove nut and washer from tire valve. Insert valve stem from inside rim, through valve hole and seat valve stem base against rim. Install washer and nut on stem and tighten nut.

b. Lubricate tire bead liberally with tire and rim lubricant.

c. Position tire (1) on wheel (2) at an angle so part of lower bead is below wheel rim on side opposite valve stem. Clamp locking jaw pliers (3) on rim directly opposite valve stem. The pliers will keep lower bead from coming over rim when mounting.

d. Insert curved end of long tire iron (4) between lower bead and rim approximately 8 to 10 inches from position of locking jaw pliers (3). Push down on tire where pliers are located and lever tire iron to force lower bead down over rim. Make sure that lower bead at location of pliers goes into groove in wheel rim.



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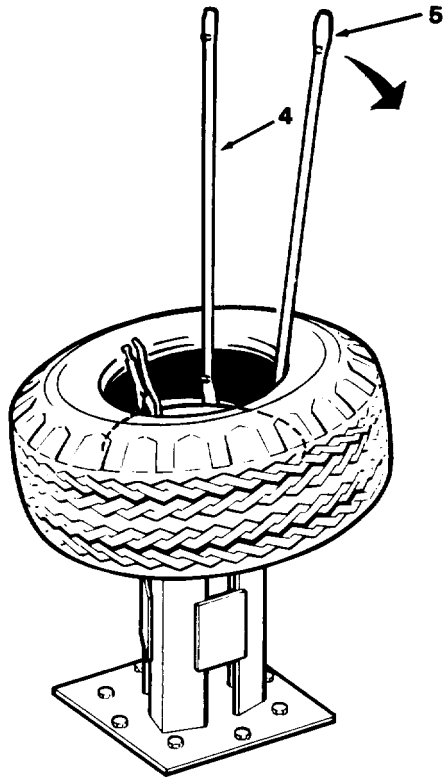
4-23. TIRE MOUNTING (cont)

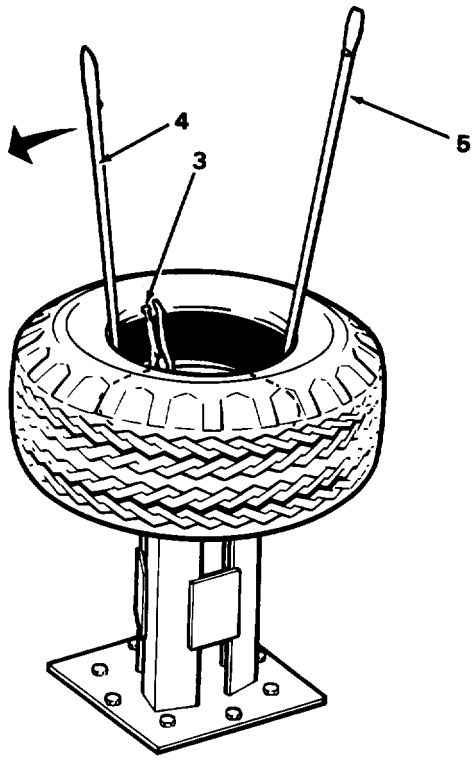
e. Hold long tire iron (4) down in first position. Insert curved end of long tire iron (5) between bead and rim several inches from tire iron (4) and lever another bite of bead over rim.



f. Hold tire iron (5) down. Remove tire iron (4) and insert between bead and rim on opposite side of pliers (3). Lever tire iron (4) to force another bite of bead over rim.

g. Repeat step f using tire irons alternately and working toward stem until entire bead is over rim. Remove locking jaw pliers (3) after more than half the bead is over rim.

h. Apply tire and rim lubricant liberally around circumference of upper bead.



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4-23. TIRE MOUNTING (cont)

i. Position tire (1) so part of upper bead is below rim on side opposite valve stem. Clamp locking jaw pliers (3) on rim on side opposite valve stem.

j. Insert curved end of long tire iron (4) between upper bead and rim approximately 10 to 12 inches from position of locking jaw pliers (3). Push down on tire (1) where pliers are located and lever tire iron to force upper bead down over rim.

k. Hold tire iron (4) down. Insert curved end of other tire iron (5) between bead and rim several inches from tire iron (4), and lever another bite of bead down over rim.

l. Repeat step k using tire irons alternately and working around bead and rim until entire upper bead is down over rim.

m. Remove tire irons (4 and 5) and pliers (3).

n. Remove hex nuts (6), flat washers (7) and hex bolts (8). Remove wheel (2) and tire (1) from pedestal (9).

o. Inflate Tire.

(1) Stand tire upright and hold while applying air. Applying body weight to top of tire will usually seat tire beads and tire will inflate.

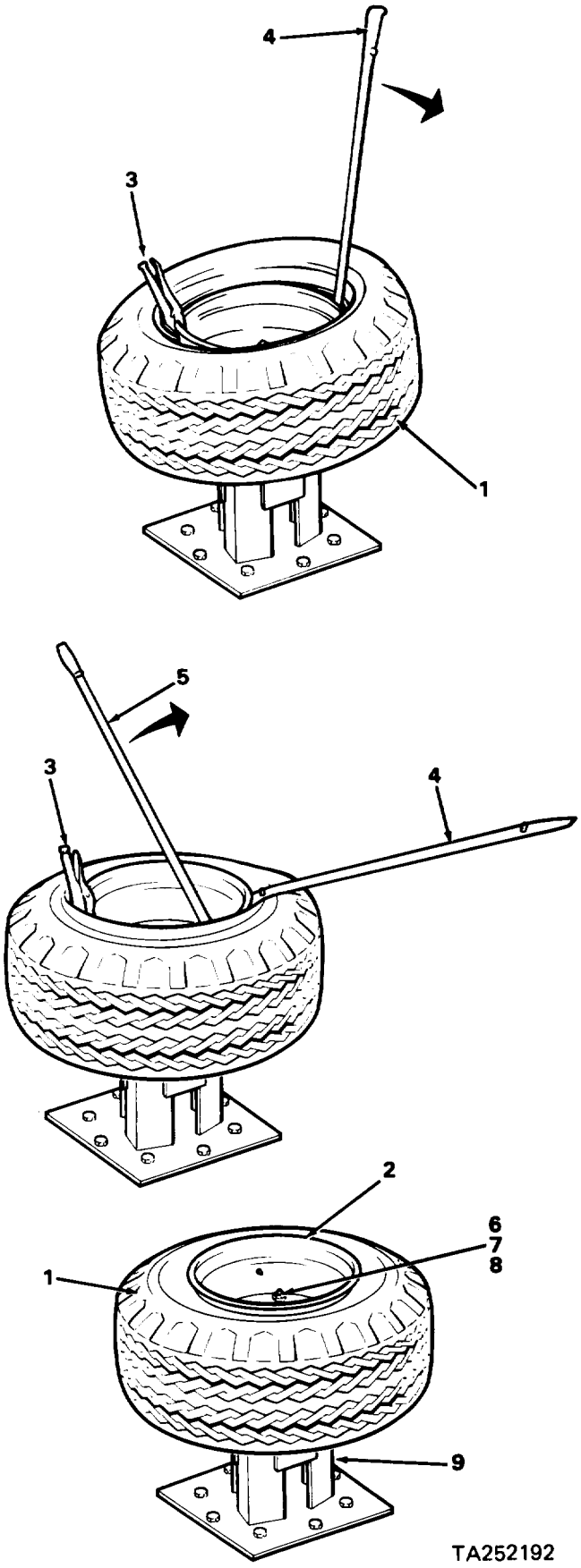
CAUTION

Excessive pressure will damage tire internal structure.

NOTE

If tire beads do not seat during inflation, put a bead expander around outside center of tire to compress tire and force beads to seat. If a bead expander is not available, use load binder and chain. Apply only enough pressure on tire to lightly seal beads against rim.

(2) Inflate tire to 85 psi (4.07 KPa).



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Section VIII. MAINTENANCE OF FRAME AND TOWING COMPONENTS

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Coupler	4-46
Safety Chains	4-47
Lifting Eyes	4-47
Spare Tire Carrier	4-48
Landing Gear	4-49
Storage Box Cover	4-50
Pod Stops	4-50

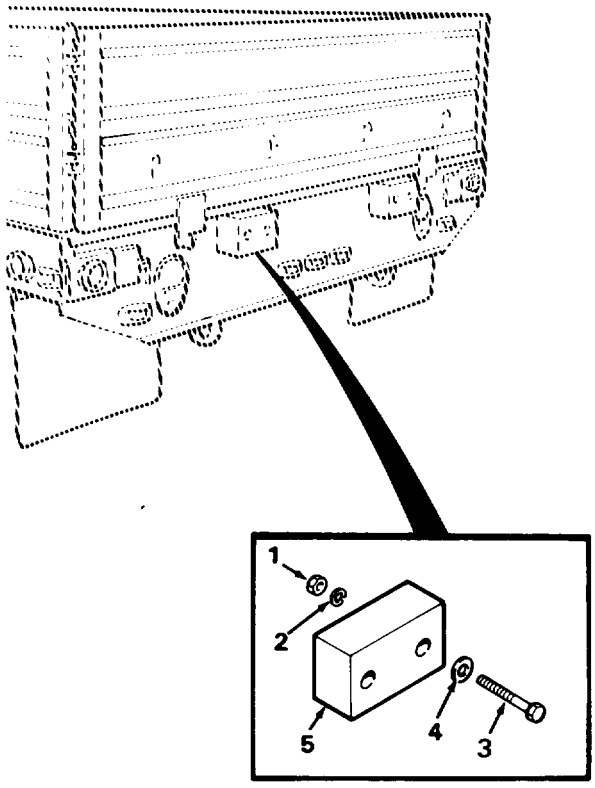
4-24. BUMPERS

Materials/Tools

General mechanics tool kit
Torque wrench, 3/8 inch drive, 0-150 lb-ft.
Socket, 3/4 inch, 3/8 inch drive

a. Removal. Remove two hex nuts (1), lock washers (2), cap screws (3), flat washers (4) to remove each of two bumpers (5).

b. Installation. Install each bumper (5) with two cap screws (3), flat washers (4), lock washers (2) and hex nuts (1). Tighten hex nut to 35 lb-ft.



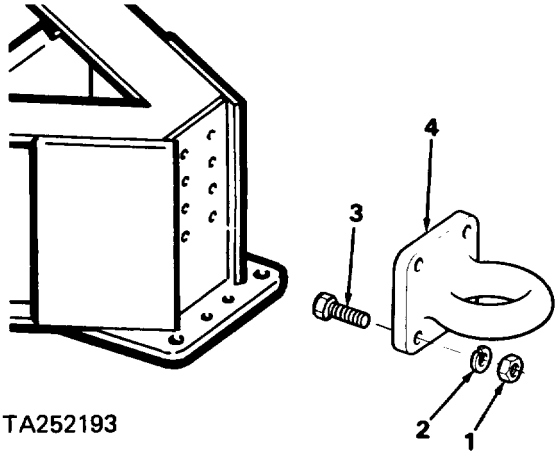
4-25. COUPLER

Materials/Tools

General mechanics tool kit
Four lock washers, 3/4 inch
Torque wrench, 3/4 inch drive, 0-600 lb-ft.
Socket, 1-1/8 inch, 3/4 inch drive

a. Removal. Remove four hex nuts (1), lock washers (2), cap screws (3) and coupler (4). Discard lock washers.

b. Installation. Mount coupler (4) on frame with four cap screws (3), new lock washers (2) and hex nuts (1). Tighten hex nuts to 300 lb-ft.



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4-26. SAFETY CHAINS

Materials/Tools

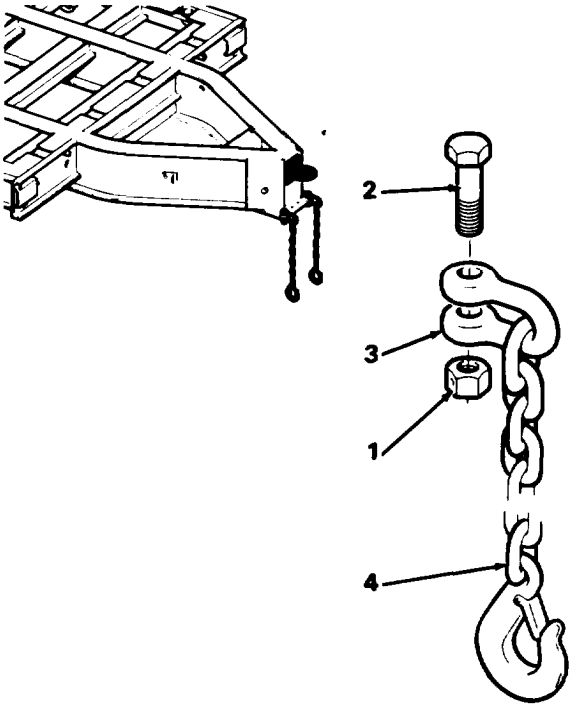
General mechanics tool kit
Torque wrench, 3/4 inch drive, 0-600 lb-ft.
Socket, 1-5/16 inch, 3/4 inch drive

a. Removal. Remove jam nuts (1), cap screws (2) and shackle (3) with safety chain (4). Slide shackle from chain link.

b. Installation. Insert shackle (3) through end link on safety chain (4). Mount shackles with chain to frame with cap screws (2) and jam nuts (1). Tighten jam nuts until shackle is snug on frame.

NOTE

Minimum backoff torque for jam nut (1) is 30 lb-ft.



4-27. LIFTING EYES

Materials/Tools

General mechanics tool kit
Torque wrench, 3/8 inch drive, 0-150 lb-ft.
Socket, 7/16 inch, 3/8 inch drive

a. Removal.

(1) Extend lifting eye (1).

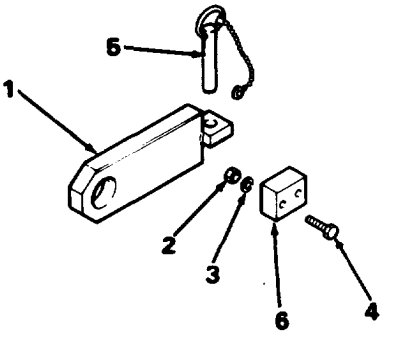
(2) Remove two hex nuts (2), lock washers (3) and cap screws (4) to remove pin and chain (5) and block (6).

(3) Slide out lifting eyes (1).

b. Installation.

(1) Slide lifting eyes (1) into channels at comers of frame.

(2) Fasten block (6) and pin and chain (5) to frame with two cap screws (4), lock washers (3) and hex nuts (2). Tighten hex nuts to 8 lb-ft.



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4-28. SPARE TIRE CARRIER

Materials/Tools

Dry cleaning solvent (item 3, app E)
Wiping rag (item 10, app E)
General mechanics tool kit
Torque wrench, 3/8 inch drive, 0-150 lb-ft.
Socket, 1/2 inch, 3/8 inch drive

a. Removal.

(1) Remove spare tire (para. 2-18a).

(2) Place wheel nuts (1) on studs (2).

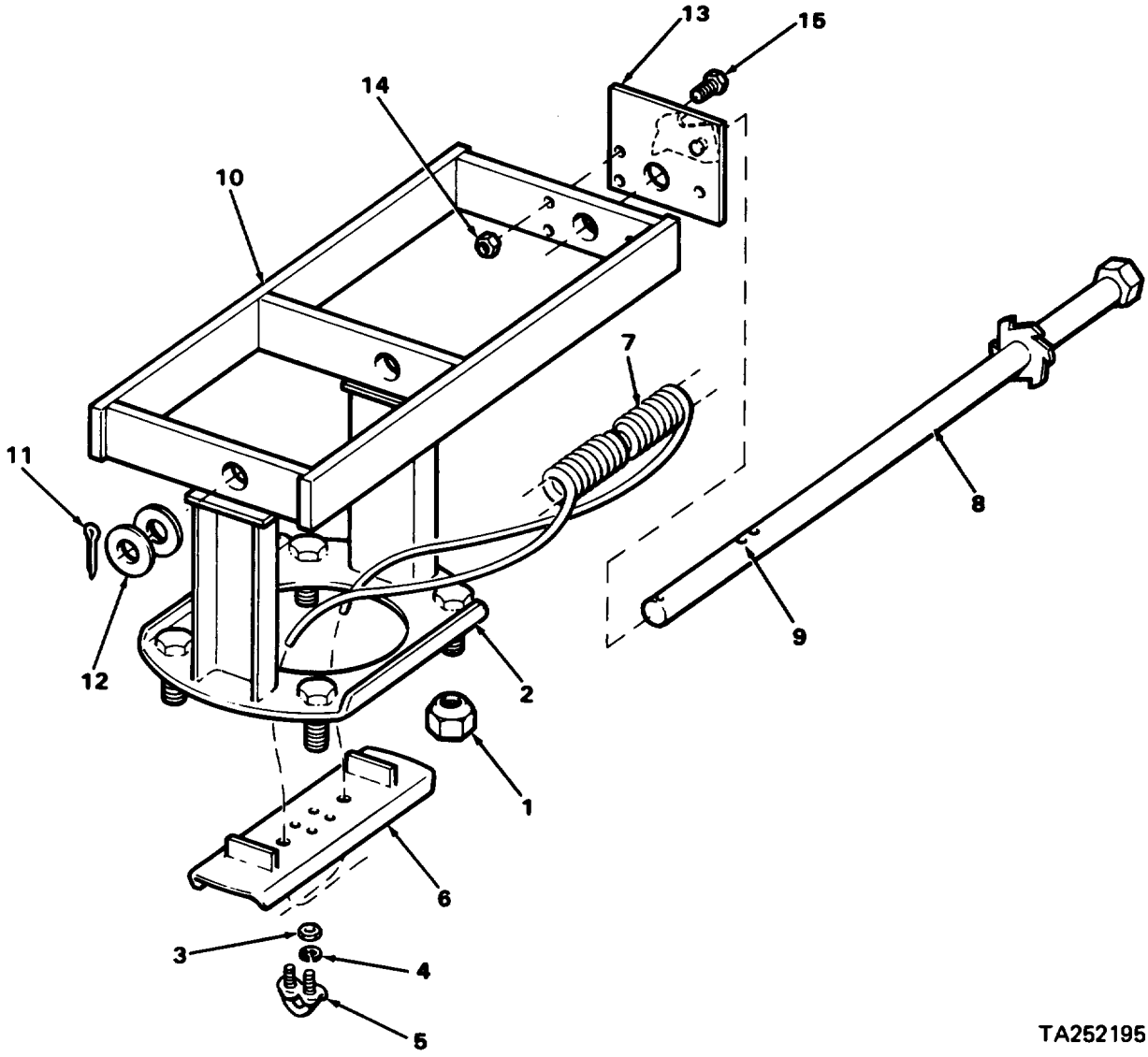
(3) Remove nuts (3), lock washers (4) and clamps (5). Remove pickup member (6).

(4) Unwind cable (7) from shaft (8). Pull cable from two holes (9) in shaft.

NOTE
Main member (10) is welded to frame and cannot be removed.

(5) Remove cotter pin (11) and two flat washers (12). Withdraw shaft (8) from main member (10), and pawl plate (13).

(6) Remove three lock nuts (14) and cap screws (15) to detach paw] plate (13) from main member.



4-28. SPARE TIRE CARRIER (cont)

b. Installation.

(1) Mount pawl plate (13) on main member (10) with three cap screws (15) and lock nuts (14).

(2) Slide shaft (8) through pawl plate (13) and main member (10). Install two flat washers (12) and cotter pin (11).

(3) Feed ends of cable (7) through holes (9) in shaft (8) so free lengths are equal.

(4) With each half of cable (7) on same side of shaft (8), rotate shaft several turns to wrap cable on shaft.

(5) Insert free ends of cable (7) into outer most holes in pickup member (6) and bend each end inward approximately 3 inches.

(6) Install clamps (5), lock washers (4) and nuts (3) on pickup member (6) so both ends of cable (7) are secured by each clamp. Tighten nuts (3) on clamps to 10 lb- ft.

(7) Install spare tire (para. 2-18b).

4-29. LANDING GEAR

Materials/Tools

General mechanics tool kit

a. Removal.

(1) Remove lock nut (1), flat washers (2), cap screw (3) and crank (4) from landing gear (5).

(2) Remove pin assembly (6).

(3) Rotate landing gear (5) to the upside down vertical position so channel (7) disengages collar on trailer frame.

(4) Remove landing gear.

b. Installation.

(1) Hold landing gear (5) in upside down vertical position and place it so channel (7) is alined with collar on trailer frame.

(2) Rotate landing gear (5) on frame to normal horizontal or vertical position. Install pin assembly (6) to secure.

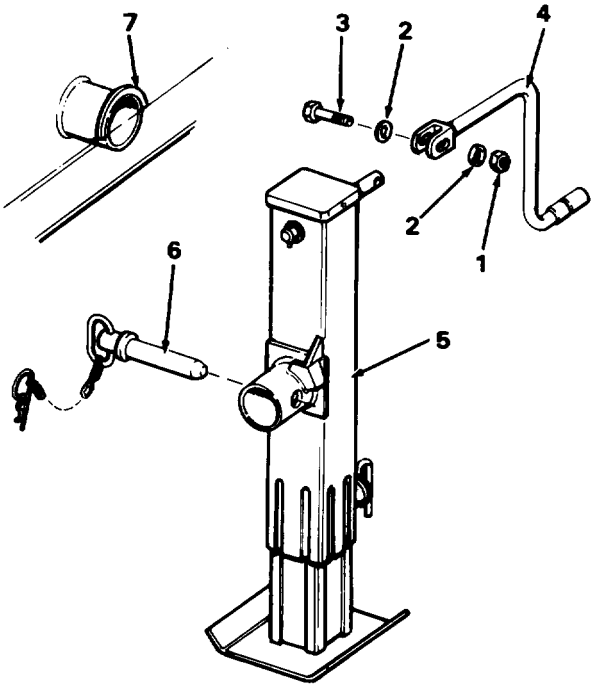
NOTE

Insure landing gear is cranked all the way up and plunger is in second lowest hole.

(3) Install crank (4) and cap screw (3), flat washers (2) and lock nut (1).

NOTE

Do not over tighten nut (1).



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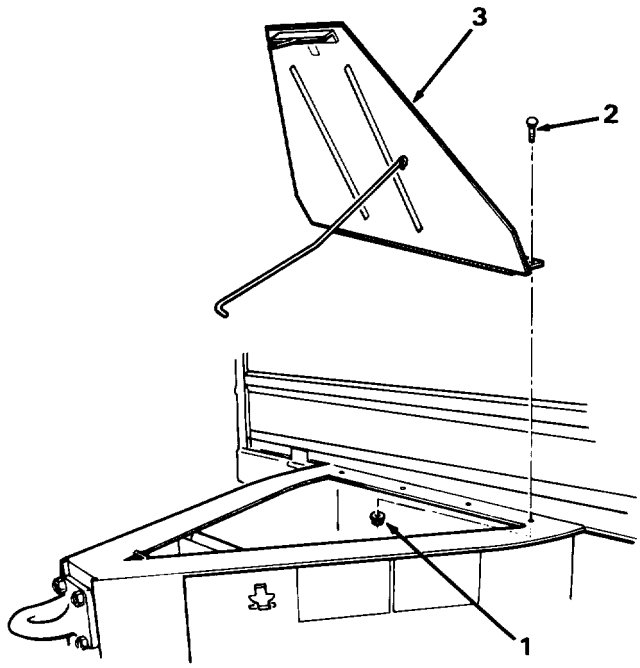
4-30. STORAGE BOX COVER

Materials/Tools

General mechanics tool kit
Torque wrench, 3/8 inch drive, 0-150 lb-ft.
Socket, 9/16 inch, 3/8 inch drive

a. Removal. Remove six flanged nuts (1) and six carriage bolts (2) from cover (3) and lift cover from frame tongue.

b. Installation. Position cover (3) on frame tongue and install six carriage bolts (2) and flanged nuts (1) to secure.



4-31. POD STOPS

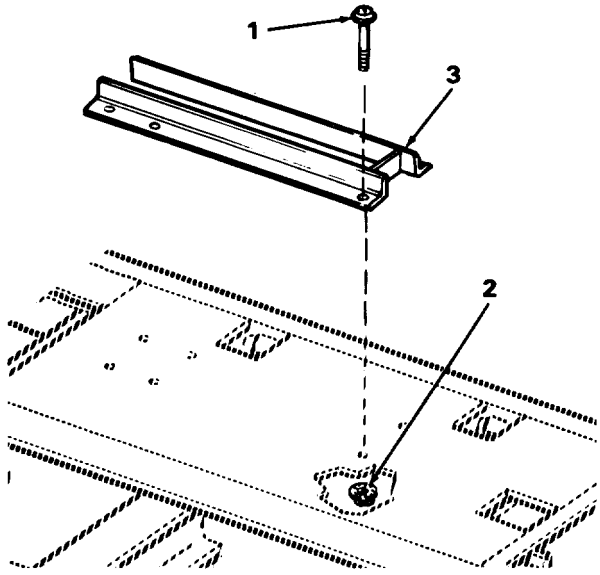
Materials/Tools

General mechanics tool kit

a. Removal. Remove six screws (1), nuts (2) and pod stop (3).

NOTE
Tie down ring must be in the up position for pod stop installation.

b. Installation. Install pod stop (3) with six screws (1) and nuts (2).



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4-32. U-BOLTS

Paragraph 4-32 has been rescinded.

Section IX. MAINTENANCE OF BODY COMPONENTS

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Reflectors	4-52
Splash Guards	4-53
Data Plates	4-53
Manifest Holder	4-54
Air Line Guards	4-54
Clearance Light Mounting Bracket	4-54
Jackknife Strips	4-55

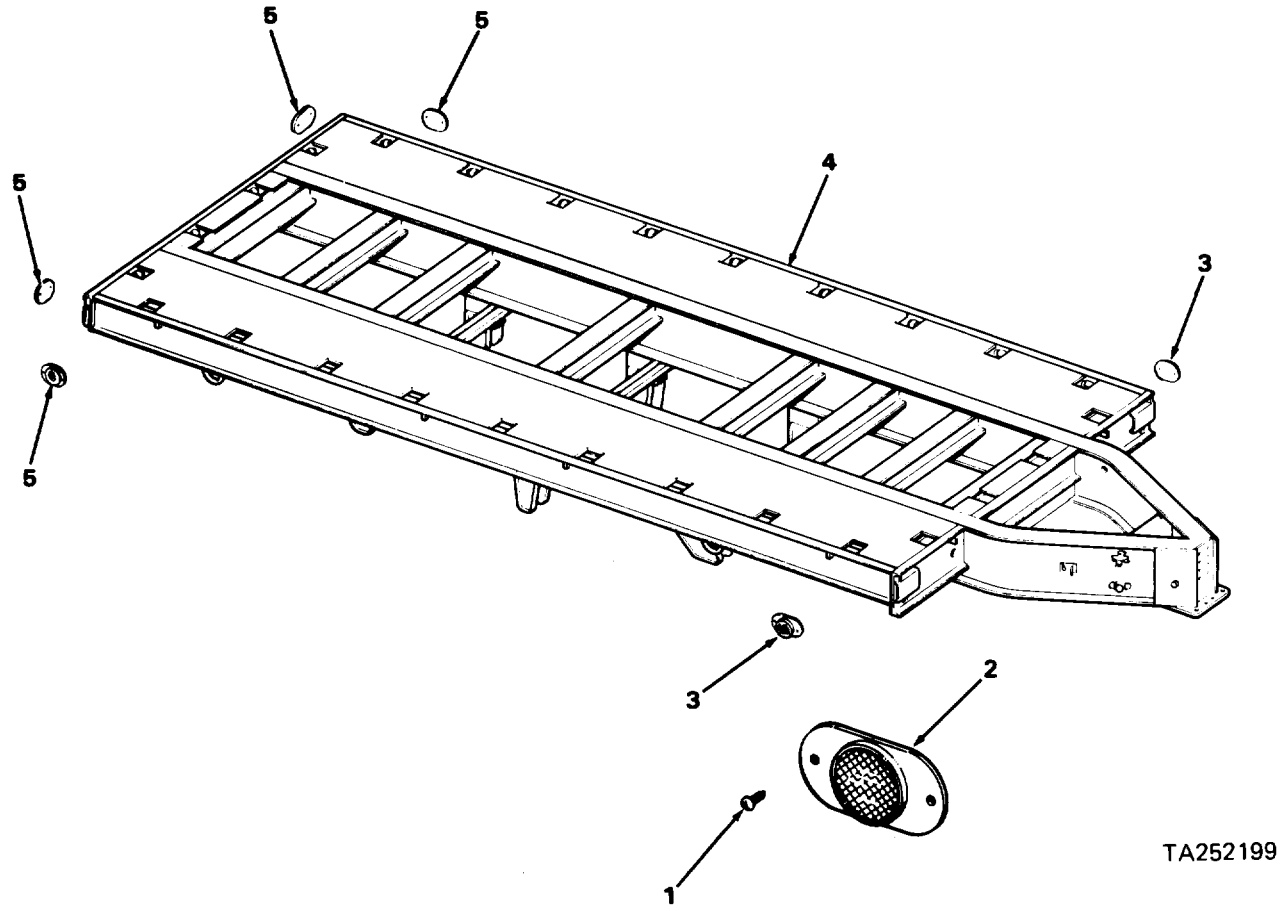
4-33. REFLECTORS

Materials/Tools

1/4 inch wrench

a. Removal. Remove two self-tapping screws (1) to remove any defective reflector (2). Amber reflectors (3) are located forward each side of frame (4). Red reflectors (5) are located on rear and each side rear of frame.

b. Installation. Install each red reflector (5) and amber reflector (3) with two self-tapping screws (1).



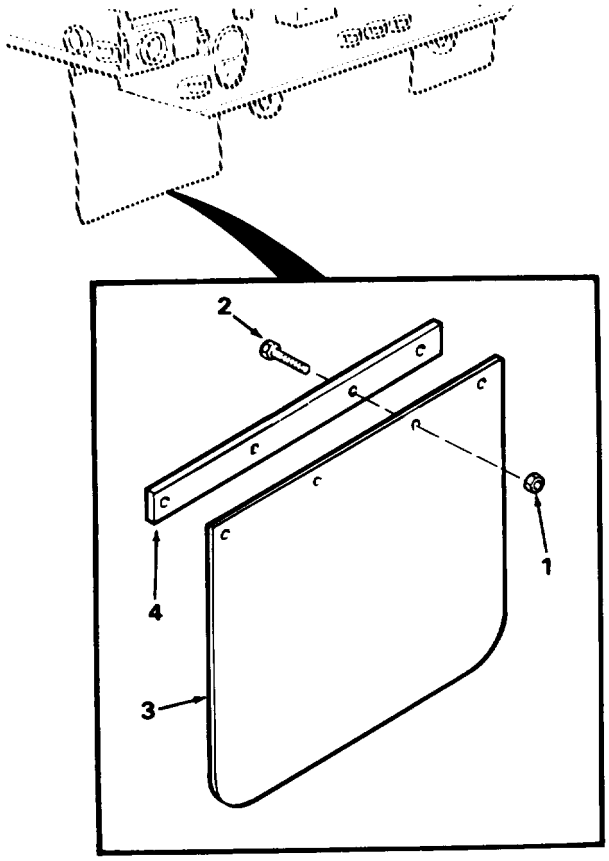
4-34. SPLASH GUARDS

Materials/Tools

General mechanics tool kit
Torque wrench, 3/8 inch drive, 0-150 lb-ft.
Socket, 1/2 inch, 3/8 inch drive

a. Removal. Remove four hex nuts (1) and cap screws (2) to remove each mud flap (3) and backing strap (4).

b. Installation. Install each mud flap (3) and backing strap (4) with four cap screws (2) and hex nuts (1). Tighten hex nuts to 15 lb-ft.



4-35. DATA PLATES

Materials/Tools

General mechanics tool kit
Blind head riveter
Rivets

a. Removal.

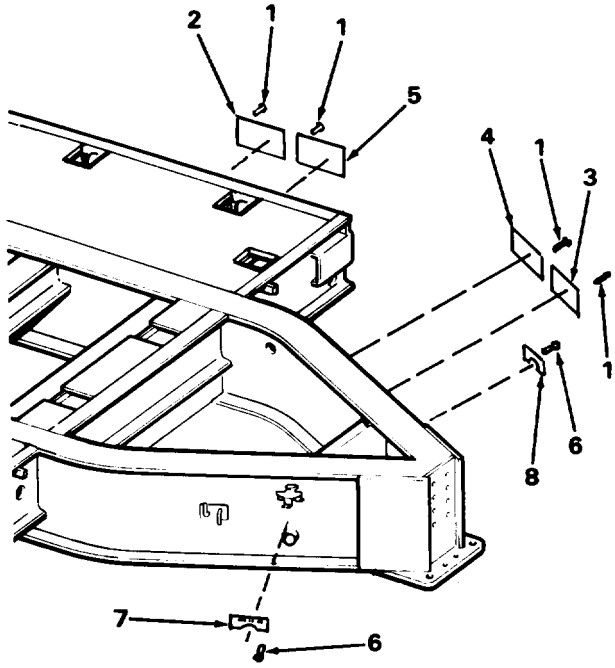
(1) Remove four pop rivets (1) to detach any defective identification plate (2), instruction plate (3), lubrication plate (4) or certification plate (5).

(2) Remove two pop rivets (6) to detach defective service identification plate (7) or emergency identification plate (8).

b. Installation.

(1) Install service identification plate (7) and emergency identification plate (8) with two pop rivets (6) each.

(2) Install identification plate (2), instruction plate (3), lubrication plate (4) and certification plate (5) with four pop rivets (1) each.



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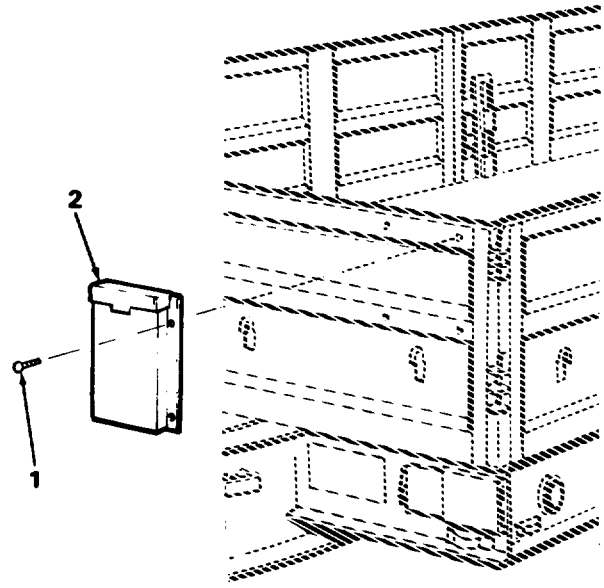
4-36. MANIFEST HOLDER

Materials/Tools

Open end wrench, 5/16 inch

a. Removal. Remove four self-tapping screws (1) and manifest holder (2).

b. Installation. Mount manifest holder (2) on front side rack with four self-tapping screws (1).



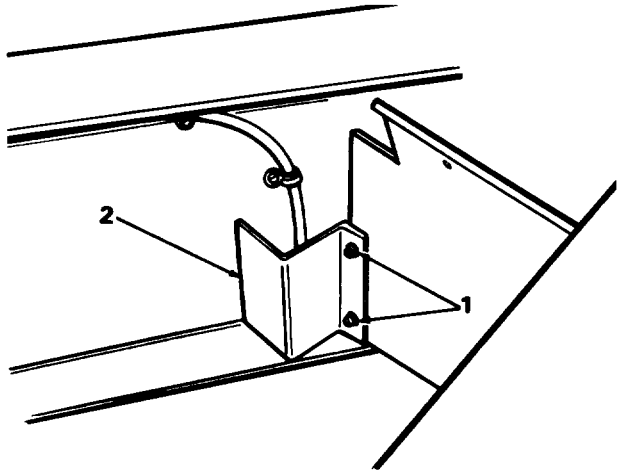
4-37. AIR LINE GUARDS

Materials/Tools

Open end wrench, 7/16 inch

a. Removal. Remove two nuts (1) and air line guard (2).

b. Installation. Mount air line guard (2) with two nuts (1).



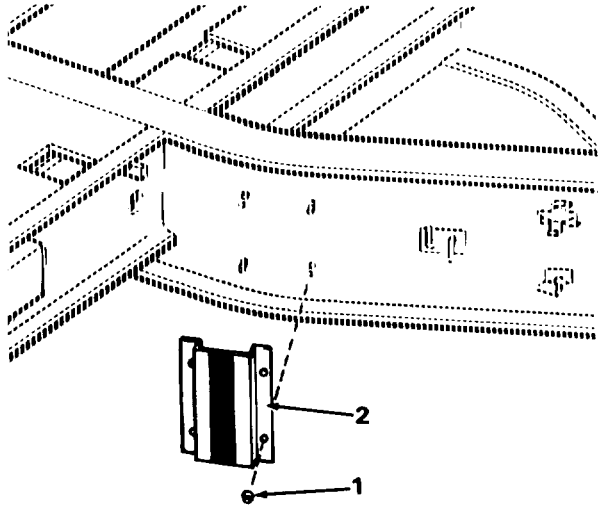
4-38. CLEARANCE LIGHT MOUNTING BRACKETS

Materials/Tools

Open end wrench, 7/16 inch

a. Removal. Remove four nuts (1) and mounting bracket (2).

b. Installation. Attach mounting bracket (2) with four nuts (1).



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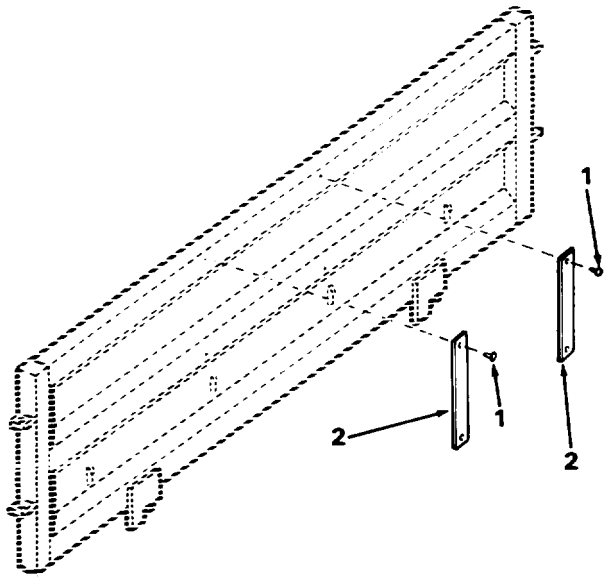
4-39. JACKKNIFE STRIPS

Materials/Tools

General mechanics tool kit

a. Removal. Remove two screws (1) and jackknife strip (2).

b. Installation. Mount jackknife strip (2) with two screws (1).



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CHAPTER 5

FIELD MAINTENANCE INSTRUCTIONS (DIRECT SUPPORT MAINTENANCE)

Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

Page
Common Tools and Equipment 5-1
Special Tools, TMDE and Support Equipment 5-1
Repair Parts..... 5-1

5-1. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the table of organization and equipment (TOE) or the modified table of organization and equipment (MTOE) applicable to your unit.

5-2. SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

Hub extension, part number P-1000 (refer to app G).

5-3. REPAIR PARTS

Repair parts are listed and illustrated in Appendix F of this manual.

Section II. MAINTENANCE OF SERVICE BRAKES

Page
Relining Brake Shoes 5-2
Turning Drums 5-3

5-4. RELINING BRAKE SHOES

Materials/Tools

Cleaning compound (Item 1, app E)
Brake linings
Lining rivets
Brake and clutch reliner
Air filtering respirator
Safety glasses

NOTE
Procedures are given for one brake shoe; there are eight.

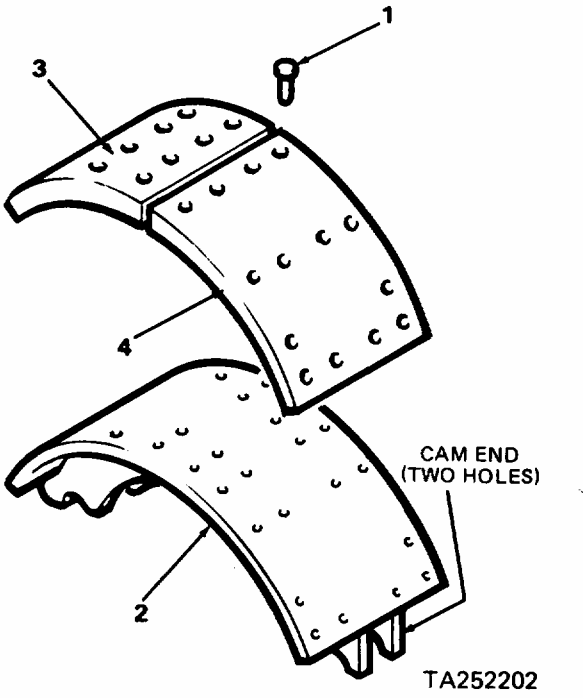
a. Remove rivets (1) from brake shoe (2), and remove and discard old brake linings (3 and 4).

WARNING
DO NOT use a dry brush or compressed air to clean brake shoes. There may be asbestos dust on brake shoes which can be dangerous to your health if you breathe it. (Dampen surface of lining with water and use a soft bristle brush.)

b. Clean brake shoe (2) thoroughly, using a brush and water to remove mud, and cleaning compound to remove grease and oil.

c. Position new cam end brake lining (3) on the brake shoe (2).

NOTE
Be sure cam end lining is installed on cam end of shoe. Cam end lining is tapered more toward the end of shoe than anchor end lining. Cam end of shoe has two holes in each shoe bracket. Anchor end of shoe has one hole in each bracket.



NOTE
If brake drums have been machined (para. 5-5), install shims between the brake shoe and brake lining of the same thickness as the metal removed from the brake drums.

d. Install rivets (1) in the two center holes of the brake shoe (2) and brake lining (3) to secure the brake lining.

e. Install the remaining rivets (1) in the brake lining (3) to secure it to the brake shoe (2).

f. Check the contact of the brake lining with the brake shoe. A 0.005 inch feeler gage should not enter between the brake shoe and brake lining at any point.

5-4. RELINING BRAKE SHOES (cont)

g. Install anchor end lining (4) in same way (Steps c through f).

h. Repeat Steps c through g for remaining brake shoes.

i. Check shoes against drum for contact. Brake shoes must have 80 percent contact between lining and drum surface. It is necessary that the contact be in the middle of the lining surface and continuous.

WARNING

Asbestos dust is dangerous to your health. Wear respirator to avoid inhaling dust.

j. If lining to drum surface contact is not 80 percent, the shoes should be circle ground to comply.

5-5. TURNING DRUMS

Materials/Tools

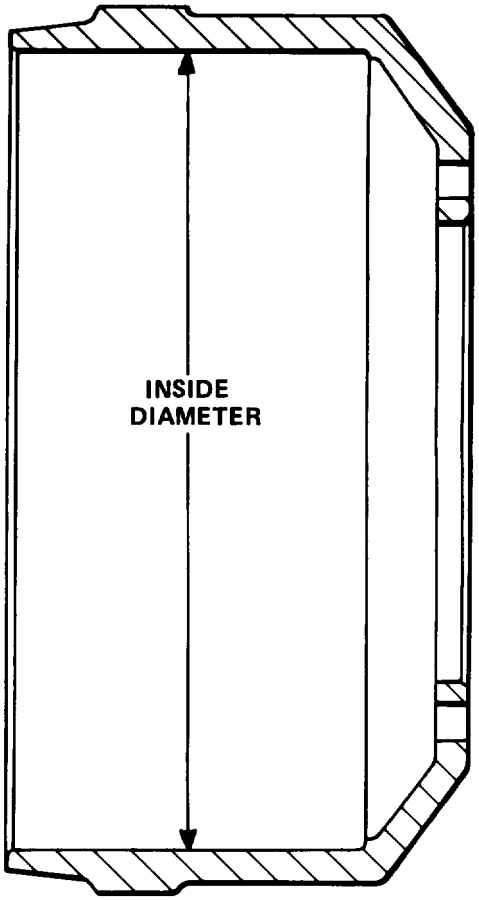
Cleaning compound (Item 1, app E)
Wiping rag (Item 1, app E)
Brake drum lathe
Safety glasses

a. Clean brake drum with cleaning compound to remove dirt and grease.

b. Inspect the brake drum for warpage, cracks, scored braking surface, and out-of-round condition. If inspection shows the brake drum to be in unsatisfactory condition, refinish the brake drum in the following manner:

c. Measure the inside diameter of the brake drum. New brake drums measure 16.490 to 16.510 inches. Brake drums should be refinished if scoring or run-out exceeds 0.006 inch.

d. Brake drums having an inside diameter larger than 16.650 inches must be replaced.



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e. Install brake drum on lathe; and refinish surface, taking off as little of the metal as possible to true the surface. If refinishing requires removal of more than 0.070 inch of metal (0.140 inch in diameter), replace the brake drum.

Finish inside diameter to 200 microinches.

Section III. MAINTENANCE OF SUSPENSION

Page
Springs and Suspension 5-4
Torque and Adjustment 5-6
Axle Replacement 5-8

5-6. SPRINGS AND SUSPENSION

Materials/Tools

General mechanics tool kit
Open end wrench, 1-5/16 inch
Ratchet, 3/4 inch drive
Socket, 1-5/16 inch, 3/4 inch drive
Torque wrench, 3/4 inch drive, 0-600 lb-ft.
Safety glasses

NOTE
Following procedures are for one complete axle suspension. If only one wheel requires maintenance, perform steps for that wheel only.

a. Removal.

(1) Jack up front or rear axle high enough to relax tension on springs.

(2) Block up corners of trailer (front or rear).

(3) Remove two hex nuts (1), bolts (2), and torque arm (3).

CAUTION
The rollers for front and rear springs at either end are all different. Do not mix up parts.

(4) Remove hex nut (4), bolt (5), and roller (6).

(5) Remove hex nut (7), bolt (8) and roller (9).

(6. Support spring (10) to prevent it from dropping. Remove four hex nuts (11) and bottom plate (12).

(7) Remove spring (10) and U-bolts (13).

(8) Remove two screws (14), lock washers (15), flat washers (16) and bumper (17).

(9) Perform same procedure to remove other axle suspension components if necessary.

B. Installation.

(1) Install each bumper (17) on studs and secure with flat washers (16), lock washers (15) and nuts (14).

(2) Place U-bolts (13) over axle (18) at mounting pads (19).

NOTE
Hook end of all springs must be toward equalizer bolt (12).

(3) Raise spring (10) and support in position under mounting pad (19).

(4) Install bottom plate (12) with four hex nuts (11) but do not tighten nuts.

(5) Install roller (9), bolt (8) and hex nut (7). Tighten nut fully but roller must be free to rotate.

(6) Install roller (6), bolt (5) and hex nut (4). Tighten nut fully but roller must be free to rotate.

(7) Adjust position of spring (10) if necessary so spring is centered. Tighten nuts (11) to 350 lb-ft (475 Nm).

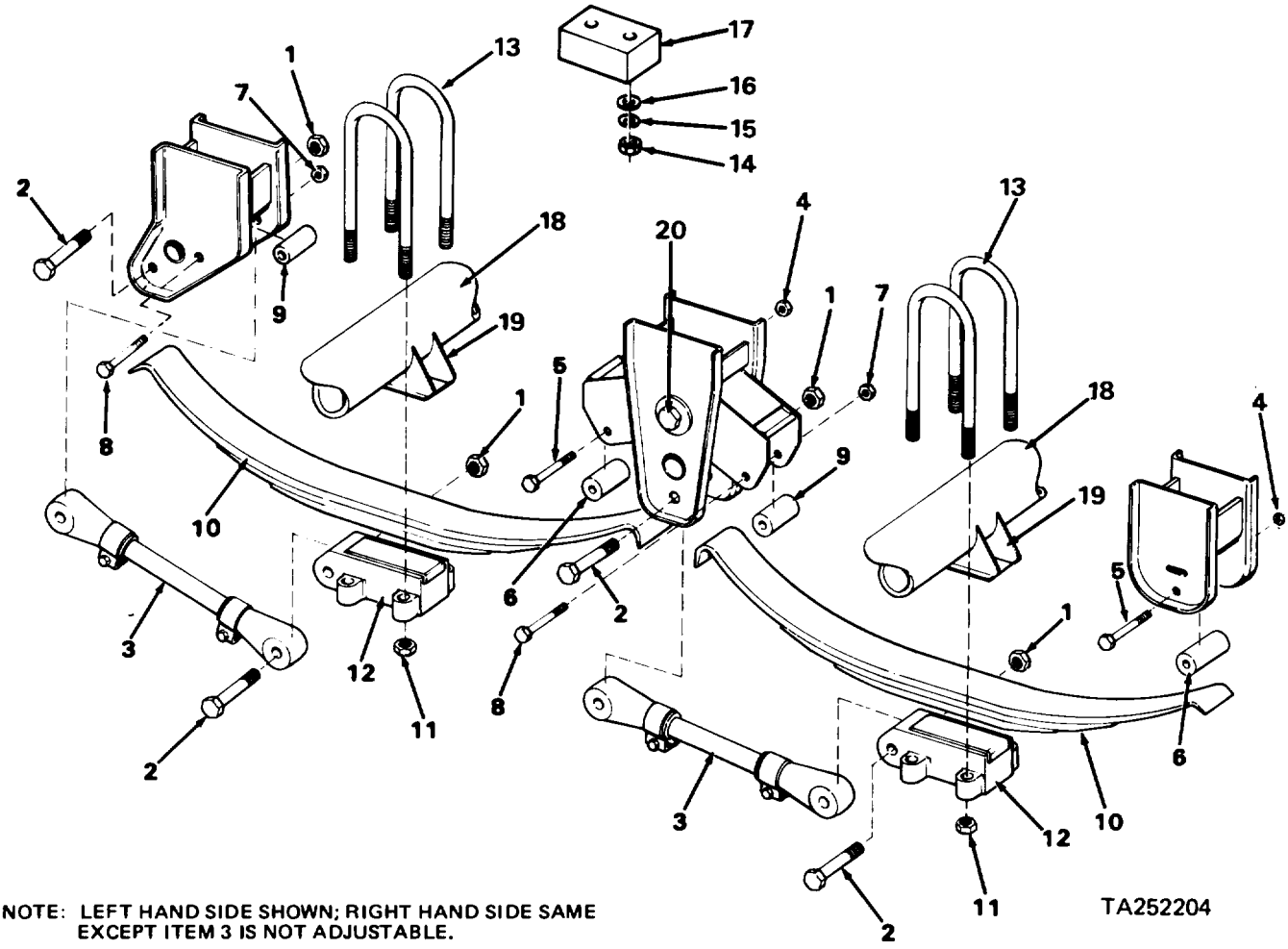
(8) Install torque arm (3), bolts (2) and hex nuts (1). Tighten nuts to 250 lb-ft (339 Nm).

(9) Perform same procedure for other axle suspension components if necessary.

(10) Remove blocking from under corners of trailer.

(11) Lower axle and remove jacks.

(12) Adjust torque arms (para. 5-7).



NOTE: LEFT HAND SIDE SHOWN; RIGHT HAND SIDE SAME EXCEPT ITEM 3 IS NOT ADJUSTABLE.

5-7. TORQUE ARM ADJUSTMENT

Materials/Tools

Hub extensions, part number P-1000, four required (refer to app G)
Pipe wrench, 18 inch
Tape measure, 50 foot
Torque wrench, 1/2 inch drive, 0-175 ft-lbs.
General mechanics tool kit

NOTE

After suspension installation aline axles to insure proper tracking of HE-MAT and to avoid excessive tire wear.

a. Level the empty trailer.

b. Make certain that the equalizers are level and that all spring ends are bearing on wear pads.

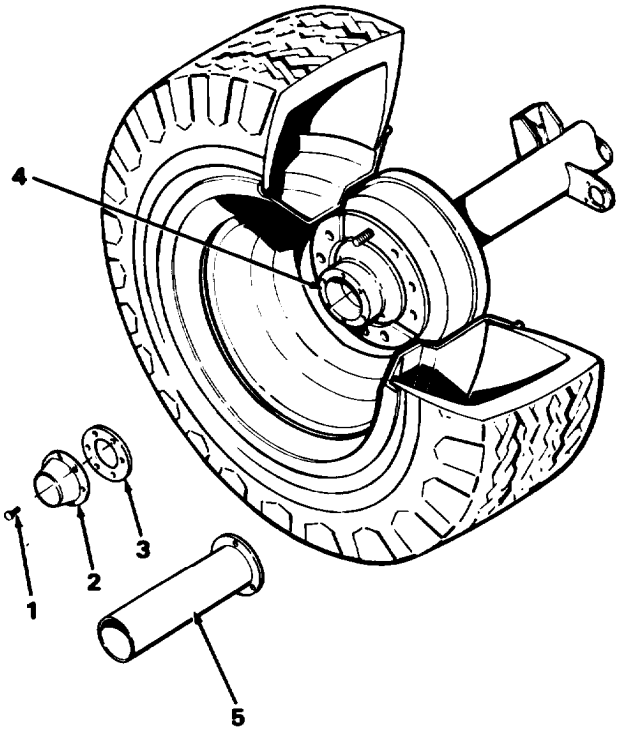
c. Remove six screws (1), hub cap (2) and gasket (3) at each wheel hub (4).

d. Install hub extension (5) on each wheel hub (4) with screws (1).

e. Measure distance between center of hole (6) to left hand hub extension (7) and record as LL.

f. Measure distance between center of hole (8) to right hand hub extension (9) and record as LR.

g. Distance LL should equal LR if axle is alined. If the LL does not equal LR, loosen clamp bolts (10) and turn rod (11) to adjust length of torque arm (12) and aline axle. If LL is greater than LR, shorten torque arm. If LL is less than LR, lengthen torque arm.



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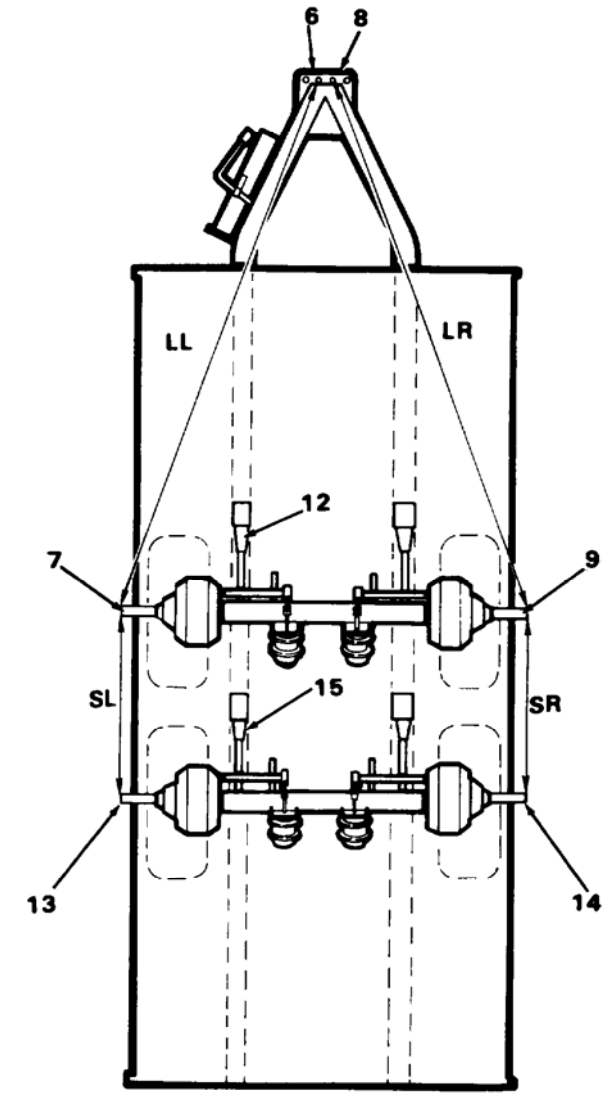
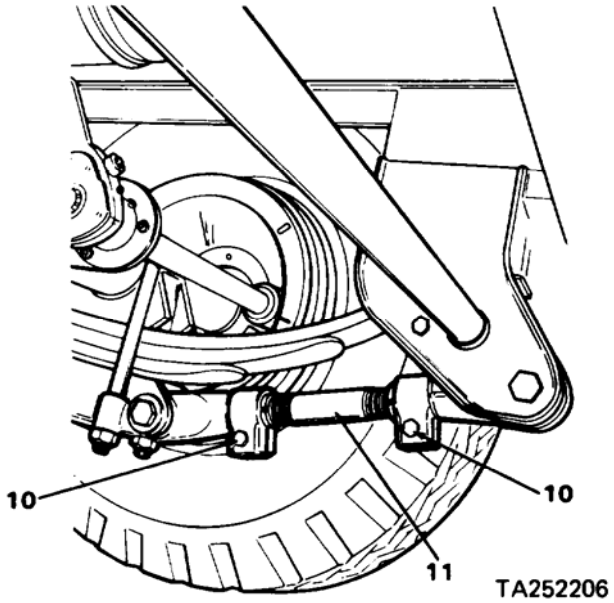
5-7. TORQUE ARM ADJUSTMENT (cont)





h. Check distances LL and LR and continue to adjust torque arm until LL equals LR. Tighten clamp bolts (10) on front torque arm (12) to 55-60 lb-ft (74.6-81.3 Nm).

i. Measure spacing SL between hub extensions (7 and 13) and record.

j. Measure spacing SR between hub extensions (9 and 14) and record.

k. Spacing SL should equal SR. If SL does not equal SR, loosen clamp bolts (10) on rear torque arm (15) and turn rod (11) to adjust. If SL is greater than SR, shorten torque arm. If SL is less than SR, lengthen torque arm.

l. Check spacing SL and SR and continue to adjust torque arm until SL equals SR. Tighten clamp bolts (10) on rear torque arm (15) to 55-60 lb-ft (74.6-81.3 Nm).

m. Remove screws (1) and hub extensions (5).

n. Install hub caps (2) and gaskets (3) with screws (1).

5-8. AXLE REPLACEMENT

Materials/Tools

Cleaning compound (item 1, app E)
Wiping rag (item 10, app E)
Welding machine
Welder tool kit
Personnel: 2 required
Safety glasses

NOTE

If an axle is to be removed for replacement or repair, remove axle and suspension together and disassemble after removal.

a. Removal.

(1) Disconnect air hoses from brake air chambers (para. 4-16, Steps 1 through 3).

(2) Use a suitable lifting device to lift trailer and relax spring tension.

(3) Remove torque arms and spring rollers (para. 5-6a, Steps 3 through 5).

(4) Roll rear axle assembly with wheel and suspension from underneath trailer.

(5) Remove springs from axle (para. 5-6a, Steps 6 and 7).

b. Disassembly.

(1) Jack up axle assembly and place on jack stands.

(2) Remove tires and wheels (para. 3-6 b).

(3) Remove hubs and drums (para. 4-14a).

(4) Remove brakes (1) (para. 4-15a), slack adjuster (1) (para. 4-15d), and cam shafts and bearings (1) (para. 4-15b).

(5) Remove air brake chambers (para. 4-16a).

c. Cleaning.

Clean axle thoroughly, using a brush and water to remove mud, and cleaning compound to remove grease and oil. Wipe off.

d. Inspection.

Inspect axle for cracks, breaks, broken or distorted brackets (1) and pads (2), corrosion and other damage.

e. Repair.

(1) Straighten distorted air brake chamber brackets (1), spring mounting pads (2), or axle bumpers (3), if possible. If brackets, pads or axle bumpers cannot be straightened, the axle must be replaced.

(2) Repair broken welds.

(3) Repaint the axle (chapter 5, section III).

f. Assembly.

(1) Install camshafts and bearings (5) (para.4-15b), slack adjusters (3) (para. 4-15d), and brakes (5) (para. 4-15a).

(2) Install hubs and drums (para. 4-14f).

(3) Install air brake chambers (para. 4-16d).

(4) Install wheels and tires (para. 3-6c).

g. Installation.

(1) Install springs on axle (para. 5-6b, Steps 2 through 5).

(2) Roll axle assembly with wheels and suspension underneath HEMAT. Position unit underneath suspension hangers.

(3) Install spring rollers and torque arms (para. 5-6b, Steps 6 through 9).

(4) Lower trailer.

(5) Connect air hoses to air brake chambers.

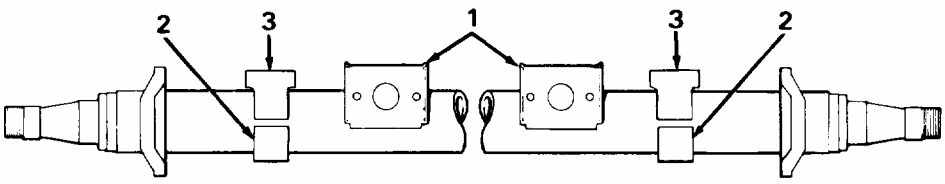
(6) Close drain cocks on air tanks.

(7) Adjust torque arms (para. 5-7).

(8) Uncage brakes (para. 2-27b).

(9) Adjust air brake chamber (para. 4-16b).

(10) Adjust brakes (4-15c).



Section IV. MAINTENANCE OF BODY COMPONENTS

Page
Floor Boards 5-9
Gates 5-10

5-9. FLOOR BOARDS

Materials/Tools

Portable electric drill
Twist drill, No. J
Countersink
Screwdriver bit (app D)
Safety glasses

a. Inspection.

Inspect all floor boards for breakage and warpage. Replace floor boards selectively after inspection for defects.

b. Removal.

Remove torx screws as required to remove any given floorboard (A through G).

c. Repair.

Refer to appendix G for manufacturing information.

d. Installation.

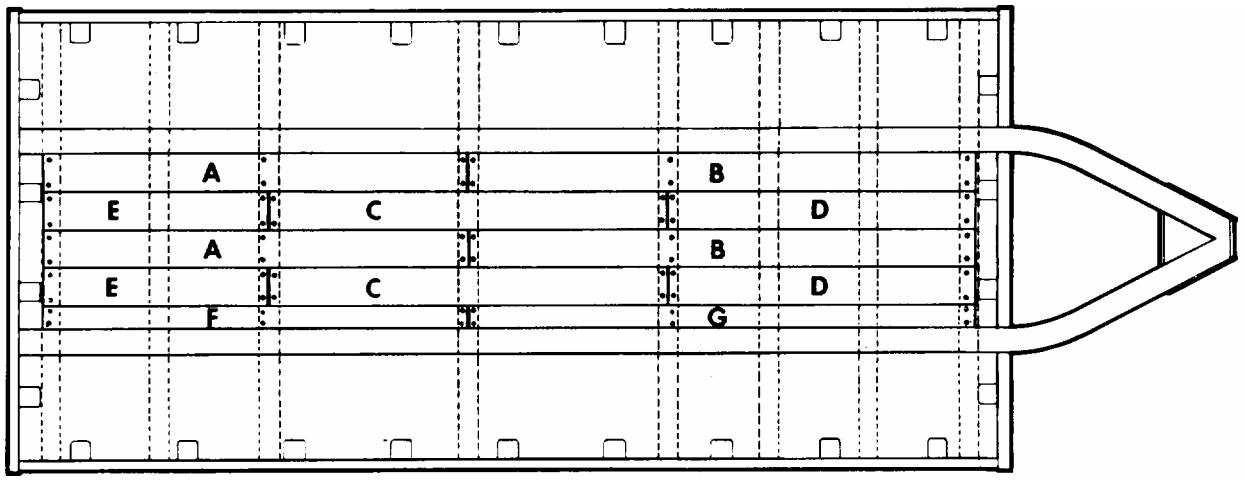
NOTE
Floor boards F and G must be selectively fit to match existing planking. After initial fitting of the width, mark the floor board for cutting. Saw or plane the floor board using power equipment. Repeat operation until floor board fits in space. There should be a tight fit for all floor boards.

(1) Place replacement floor board in position on frame. Mark location of mounting holes.

(2) Remove boards. Then using a No. J drill bit (0.277 inch) and drill, bore holes in floor board to match mounting holes in frame. Countersink holes.

(3) Install torx screws as required to secure floor board to frame. Heads of screws should be below surface of boards.

NOTE
Trailers (VIN 1S9US1722DM-063127 and after) are equipped with ship lap lumber. Refer to Bulk Items in Appendix F.



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5-10. GATES

Materials/Tools

Cleaning compound (Item 1, app E)
Wiping rag (item 10, app E)
Shop equipment, welding
Tool kit, welding
Swaging tool

a. Cleaning.

Clean gates thoroughly using a stiff bristle brush and water to remove mud, and cleaning compound to remove grease and oil. Wipe off.

b. Inspection.

Inspect gates for marred paint, corrosion, cracks, breaks, broken welds and other damage.

c. Repair.

(1) Straighten bent tie down hooks (1), latch ears (2), and latch pins (3). Be sure holes in ears are aligned so pins can enter holes without binding.

(2) Replace missing retaining cables (4). Use 6 inch length of 1/8 inch diameter 7 x 7 stainless steel aircraft cable and two swaging sleeves, part number MS51844-2 to fabricate each retaining cable.

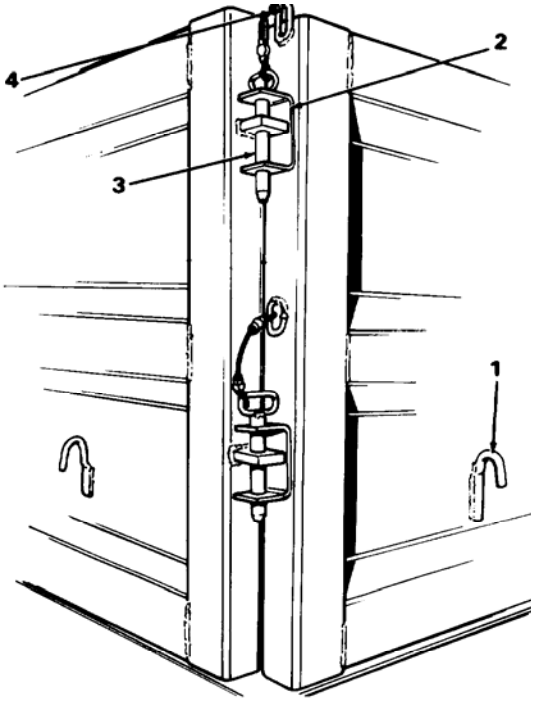
(3) Straighten bent hinge pins (5).

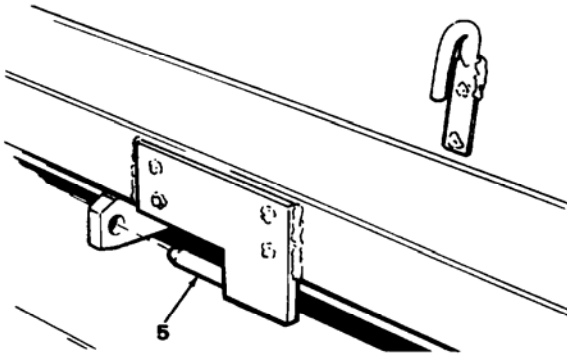
(4) Straighten bent slide bolts (6).

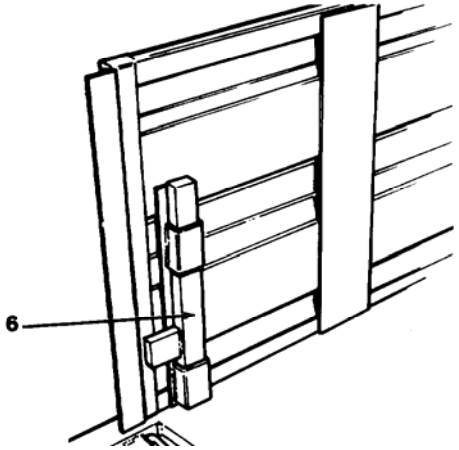
(5) If damage to gate is not too extensive, straighten member where possible. Weld up cracks in broken welds.

(6) Clean frame.

(7) Repaint gate (Chapter 5, Section III).







5-11. FRAME

Materials/Tools

Cleaning compound (item 1, app E)
Shop equipment, welding
Tool kit, welder

a. Cleaning. Clean frame thoroughly using a stiff bristle brush and water to remove mud, and cleaning compound to remove grease and oil.

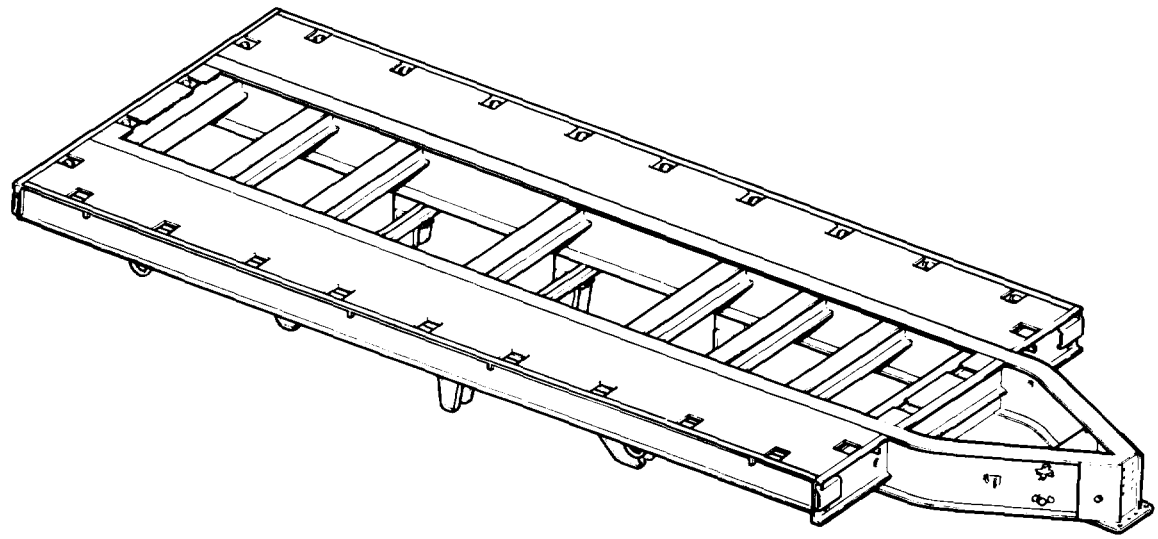
b. Inspection. Inspect frame for marred paint, corrosion, cracks, breaks, broken welds and other damage.

c. Repair.

(1) If damage to frame is not too extensive, straighten member where possible. Weld up cracks or broken welds.

(2) Clean frame.

(3) Repaint frame (chapter 5, section III).



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Section Ill. PAINTING INSTRUCTIONS

Page
Materials and Tools 5-12
Painting Procedure 5-12

5-12. MATERIALS AND TOOLS

a. Materials.

(1) Coating, polyurethane (item 2, app E)

(2) Primer coating (item 8, app E)

(3) Primer coating (item 9, app E)

(4) Thinner (item 13, app E)

(5) Dry cleaning solvent (item 3, app E)

b. Tools.

(1) Power driven compressor unit

(2) Paint spray gun

(3) Spray gun paint cup

(4) Rubber air hose

(5) Eye goggles

(6) Air filtering respirator

(7) Stiff bristle wire brush

5-13. PAINTING PROCEDURE

WARNING

The resin and hardener contained in the two-part epoxy coating may cause irritation to the skin and eyes. Plastic gloves should be worn while handling these materials. Wipe these materials from the skin using dry cleaning solvent (item 3, app E), and wash with soap and warm water if contact is made. Wear goggles when applying coating to prevent contact with the eyes.

WARNING

Coatings can cause internal injury during prolonged breathing of vapors. Wear respirator to prevent inhaling vapors. Use adequate ventilation.

NOTE

Coatings are very water sensitive. Take care to insure that water or high humidity do not come in contact with coatings at any time during reduction, application or drying.

N O T E

Do not attempt using these paints below 60 degrees F (15.5 degrees C), as proper curing will not take place.

NOTE

Once coating is mixed, a chemical reaction begins which will cause coating to completely harden. This begins to occur in 6 to 8 hours. All coatings should be used and entire paint system completely cleaned within this time period. If cleaning is not accomplished in time, remaining mixed coating will harden throughout paint system. System should be cleaned only with solvent specifically recommended by the paint manufacturer.

a. Primer Coating.

(1) Clean area to be painted to remove all dirt, grease, oil, rust and scale. Surface may be cleaned using dry cleaning solvent, wire brush or by sandblasting as required.

(2) Mix two-part epoxy primer coating in accordance with manufacturers instructions.

5-13. PAINTING PROCEDURE

(3) Using painting equipment apply an even coating of primer coating without runs or sags.

(4) Allow primer coating to dry for a minimum of 1 hour before applying top coating.

b. Top Coating.

(1) Mix two-part epoxy top coating in accordance with manufacturers instructions.

(2) Using painting equipment apply an even coating of the top coating without runs or sags.

(3) Allow finish coating to dry for 3 hours before handling.

Section IV. PREPARATION FOR STORAGE OR SHIPMENT

Page
Preparation for Storage or Shipment 5-14
Preparation for Use After Storage 5-14

5-14. PREPARATION FOR STORAGE OR SHIPMENT

a. Air Brake System.

(1) Open drain cocks on both air tanks on the trailer.

(2) Cage all four air brake chambers (para. 2-27a).

b. Tires.

(1) Reduce tire pressure to 20 psi (cold).

(2) Adjust landing gear to level trailer.

(3) Fold all trailer side gates down to shade tires from sun's rays.

5-15. PREPARATION FOR USE AFTER STORAGE

a. Tires. Inflate tires to 85 psi (cold).

b. Gates. Raise gates to locked vertical position.

c. Air System.

(1) Close air tank drain cocks.

(2) Uncage air brake chambers (para. 2-27 b).

d. Perform operator/crew and organizational preventive maintenance services.

CHAPTER 6

SUSTAINMENT MAINTENANCE INSTRUCTIONS (GENERAL SUPPORT/DEPOT MAINTENANCE)

Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

Page
Common Tools and Equipment 6-1
Special Tools, TMDE and Support Equipment 6-1
Repair Parts..... 6-1

6-1. COMMON TOOL AND EQUIPMENT

For authorized common tools and equipment, refer to the table of organization and equipment(TOE) or the modified table of organization and equipment (MTOE) applicable to your unit.

6-2. SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

Hub extension, part number P-1000 (refer to Appendix G).

6-3. REPAIR PARTS

Repair parts are listed and illustrated in Appendix F of this manual.

6-4. FRAME

Materials/Tools

Cleaning compound (Item 1, Appendix E)
Shop equipment, welding
Tool kit, welder
Safety glasses

a. Cleaning.

Clean frame thoroughly using a stiff bristle brush and water to remove mud, and cleaning compound to remove grease and oil.

b. Inspection.

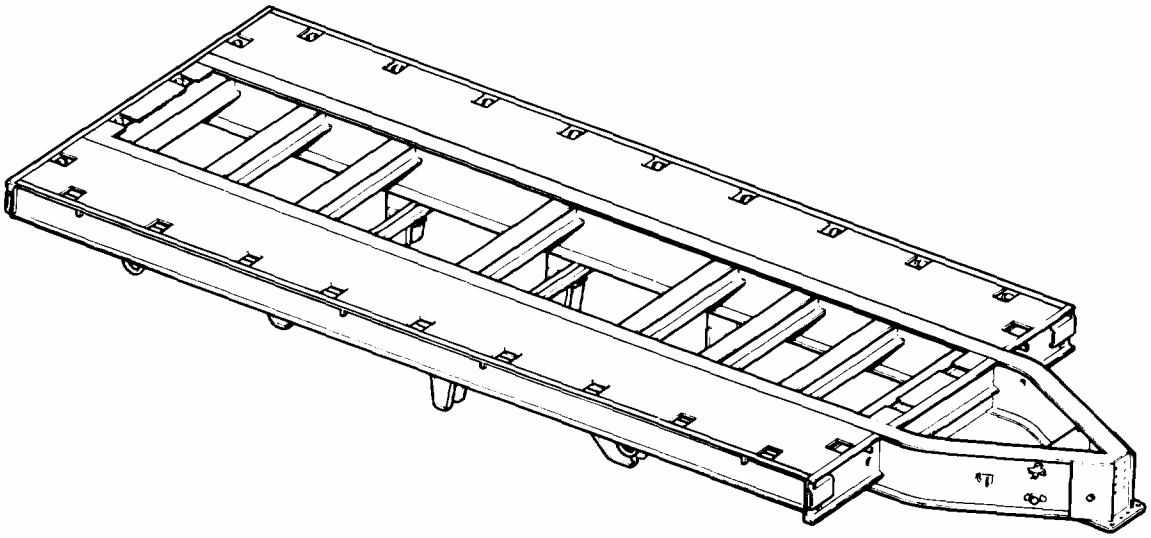
Inspect frame for marred paint, corrosion, cracks, breaks, broken welds, and other damage.

c. Repair.

(1) If damage to frame is not too extensive, straighten member where possible. Weld up cracks or broken welds.

(2) Clean frame.

(3) Repaint frame (Chapter 7, Painting Instructions).



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CHAPTER 7

PAINTING INSTRUCTIONS

Page
Materials and Tools 7-1
Painting Procedure 7-1

7-1. MATERIALS AND TOOLS

a. Materials.

(1) Coating, polyurethane (item 2, app E)

(2) Primer coating (item 8, app E)

(3) Primer coating (item 9, app E)

(4) Thinner (item 13, app E)

(5) Dry cleaning solvent (item 3, app E)

b. Tools

(1) Power driven compressor unit

(2) Paint spray gun

(3) Spray gun paint cup

(4) Rubber air hose

(5) Eye goggles

(6) Air filtering respirator

(7) Stiff bristle wire brush

7-2. PAINTING PROCEDURE

WARNING

Chemical Agent Resistant Coating (CARC) paint contains Hexamethylene Diisocyanyte (HDI), which is highly irritating to the skin and respiratory system. High concentrations of HDI can produce symptoms of itching and reddening of the skin, a burning sensation in the throat and nose, and watering of the eyes. In extreme concentrations, HDI can cause cough, shortness of breath, pain during respiration, increased sputum production, and chest tightness.

The following precautions must be taken whenever using CARC paint:

- **NEVER cut CARC-coated materials without high-efficiency, air-purifying respirators in use.**
- **DO NOT grind or sand painted equipment without high-efficiency, air-purifying respirators in use.**
- **BE AWARE of CARC paint exposure symptoms; symptoms can occur a few days after initial exposure. Seek medical help immediately if symptoms are detected.**

WARNING

Coatings can cause internal injury during prolonged breathing of vapors. Wear respirator to prevent inhaling vapors. Use adequate ventilation.

NOTE

Coatings are very water sensitive. Take care to insure that water or high humidity do not come in contact with coatings at any time during reduction, application or drying.

NOTE

Do not attempt using these paints below 60 degrees F (15.5 degrees C), as proper curing will not take place.

7-2. PAINTING PROCEDURE (cont)

NOTE

Once coating is mixed, a chemical reaction begins which will cause coating to completely harden. This begins to occur in 6 to 8 hours. All coatings should be used and entire paint system completely cleaned with this time period. If cleaning is not accomplished in time, remaining mix coating will harden throughout paint system. System should be cleaned only with solvent specifically recommended by the paint manufacturer.

a. Primer Coating.

(1) Clean area to be painted to remove all dirt, grease, oil, rust and scale. Surface may be cleaned using dry cleaning solvent, wire brush or by sandblasting as required.

(2) Mix two-part epoxy primer coating in accordance with manufacturers instructions.

(3) Using painting equipment apply an even coating of primer coating without runs or sags.

(4) Allow primer coating to dry for a minimum of 1 hour before applying top coating.

b. Top Coating

(1) Mix two-part epoxy top coating in accordance with manufacturers instructions.

(2) Using painting equipment apply an even coating of top coating without runs or sags

(3) Allow finish coating to dry for 3 hours before handling.

CHAPTER 8

PREPARATION FOR STORAGE OR SHIPMENT

Page
Preparation for Storage or Shipment..... 8-1
Preparation for Use After Storage..... 8-1

8-1. PREPARATION FOR STORAGE OR SHIPMENT

a. Air Brake System.

(1) Open drain cocks on both air tanks on the trailer.

(2) Cage all four air brake chambers (para. 2-27a).

b. Tires

(1) Do not reduce tire pressure.

(2) Adjust landing gear to level trailer.

(3) Fold all trailer side gates down to shade tires from sun's rays.

8-2. PREPARATION FOR USE AFTER STORAGE

a. Gates. Raise gates to locked vertical position.

b. Tires. Check tire pressure and inflate tires to 85 psi (586 kPa) (cold), if necessary.

c. Air System.

(1) Close air tank drain cocks.

(2) Uncage air brake chambers (para. 2-27b).

d. Perform operator/crew and organizational preventive maintenance services.

APPENDIX A

REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals, technical manuals, and other publications referenced in this manual and which apply to the operation, organizational, direct, and general support maintenance of the M989.

A-2. PUBLICATION INDEX

DA Pam 25-30, Consolidated Index of Army Publications and Blank Forms, should be consulted frequently for latest changes or revisions and for new publications relating to materiel covered in this technical manual.

A-3. FORMS

Refer to DA Pam 750-8, The Army Maintenance Management System (TAMMS) User's Manual, for instructions on maintenance forms.

Equipment Inspection and Maintenance Worksheet.....DA Form 2404
Maintenance Request.....DA Form 2407
Maintenance Schedule and Record.....DD Form 314
Product Quality Deficiency Report.....SF 368
Recommended Changes to Publications and Blank Forms.....DA Form 2028

A-4. FIELD MANUALS

Manual for the Wheeled Vehicle Driver.....FM 21-305
NBC Decontamination.....FM 3-11.5
NBC Protection.....FM 3-11.4
Northern Operations.....FM 31-71
Operation and Maintenance of Ordnance Materiel in Cold Weather (0°to-65°F).....FM 9-207
Visual Signals.....FM 21-60

A-5. TECHNICAL BULLETINS

Color, Marking, and Camouflage Painting of Military Vehicles, Construction Equipment, and Materials Handling Equipment.....TB 43-0209

A-6. TECHNICAL MANUALS

Inspection, Care, and Maintenance of Antifriction Bearings.....TM 9-214
Materials Used for Cleaning, Preserving, Abrading, and Cementing
Ordnance Materiel and Related Items Including Chemicals.....TM 9-247
Organizational, Direct Support and General Support Care, Maintenance,
and Repair of Pneumatic Tires and Inner Tubes.....TM 9-2610-200-24
Procedures for Destruction of Trek-Automotive Equipment to Prevent Enemy Use..... TM 750-244-6

A-7. OTHER PUBLICATIONS

Expendable/Durable Items (Except Medical, Class V,
Repair Parts, and Heraldic Items).....CTA 50-970
Operator's Manual for Welding Theory and Application..... TC 9-237

APPENDIX B

MAINTENANCE ALLOCATION CHART (MAC)

Section I. INTRODUCTION

B-1. GENERAL

a. This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

b. Section II. The MAC (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component levels, which are shown on the MAC in column (4) as:

Field – includes two columns, Unit maintenance and Direct Support maintenance. The Unit maintenance column is divided again into two more subcolumns, (C) for Operator or Crew and (O) for Unit Maintenance.

Sustainment – includes two subcolumns, General Support (H), and Depot (D).

c. Section III. The tools and test equipment requirements (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

d. Section IV. The remarks (immediately following the tools and test requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS

Maintenance functions are limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel). This includes scheduled inspection and gagings and evaluation of cannon tubes.

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.

c. Service. Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:

1. Unpack. To remove from packing box for service or when required for the performance of maintenance operations.
2. Repack. To return item to packing box after service and other maintenance operations.
3. Clean. To rid the item of contamination.
4. Touch up. To spot paint scratched or blistered surfaces.
5. Mark. To restore obliterated identification.

d. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

B-2. MAINTENANCE FUNCTIONS (cont)

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Paint. To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to the entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.

i. Replace. To remove an unserviceable item and install a serviceable counterpart in its place "Replace" is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance, and Recoverability (SMR) code.

j. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

NOTE

The following definitions are applicable to the "repair" maintenance function:

Services. Inspect, test, service, adjust, align, calibrate, and/or replace.

Fault location/troubleshooting. The process of investigating and detecting the case of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).

Disassembly/ assembly. The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

k. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

l. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/ miles) considered in classifying Army equipment/components.

B-3. EXPLANATION OF COLUMNS IN THE MAC

a. Column (1) Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

b. Column (2) Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column (3). Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions refer to "Maintenance Functions" outlined above.)

d. Column (4) Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3), by indicating work time required (expressed as man hours in whole hours or decimals) in the appropriate subcolumn. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

Field:
C..... Operator or Crew maintenance
O..... Unit maintenance
F ..... Direct Support maintenance

Sustainment:
L ..... Specialized Repair Activity
H..... General Support maintenance
D..... Depot maintenance

NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

e. Column (5) Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

f. Column (6) Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

B-4. EXPLANATION OF COLUMNS IN THE TOOLS AND TEST EQUIPMENT REQUIREMENTS

Column (1) Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

C**olumn (2) Maintenance Level.** The lowest level of maintenance authorized to use the tool or test equipment.

Column (3) Nomenclature. Name or identification of the tool or test equipment.

Column (4) National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) Tool Number. The manufacturer's part number, model number, or type number.

B-5. EXPLANATION OF COLUMNS IN THE REMARKS

Column (1) Remarks Code. The code recorded in column (6) of the MAC.

Column (2) Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

Section II. MAINTENANCE ALLOCATION CHART

(1)	(2)	(3)	(4)					(5)	(6)
			MAINTENANCE CATEGORY						
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT	TOOLS AND	
GROUP NO.	COMPONENT/ ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D	EQPT.	REMARKS
06	ELECTRICAL SYSTEM								
0609	LIGHTS	Inspect	0.1						
		Replace		0.5				1	
		Repair		0.5				1	
0609	LAMPS	Inspect	0.1						
		Replace	0.5					1	
0613	HARNESS, WIRING	Inspect		0.5					
		Replace		2.0				1	
		Repair		1.0				1	
0613	CABLE, INTER-VEHICULAR	Inspect	0.1						
		Replace	0.1					1	
11	AXLE								
1100	AXLE ASSEMBLY	Inspect		0.5					
		Replace			8.0				
		Repair			2.0			4	
12	BRAKES								
1202	SERVICE BRAKE ASSEMBLY	Adjust		0.5				1,2,3	
		Replace		1.8				1,2,3	
		Repair		3.0				1,2,3	
1202	BRAKE SHOE ASSEMBLY	Inspect		0.3					
		Replace		1.5				1,2,3	
		Repair			2.5			4	
1202	SLACK ADJUSTER	Service		0.3				1,2,3	
		Replace		0.7				1,2,3	
1202	CAMSHAFT ASSEMBLY	Inspect		1.0					
		Service		0.3				1,2,3	
		Replace		1.5				1,2,3	
1208	AIR BRAKE SYSTEM	Test		0.3					
1208	BRAKE AIR CHAMBER	Inspect		0.3					
		Adjust		0.2				1,2,3	
		Replace		1.0				1,2,3	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1)	(2)	(3)	(4) MAINTENANCE CATEGORY					(5)	(6)
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT	TOOLS AND	
GROUP NO.	COMPONENT/ ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D	EQPT.	REMARKS
1208	AIR HOSE AND FITTINGS	Inspect	0.5						
		Replace		2.0				1,2,3	
	AIR RESERVOIRS	Service	0.2					1,2,3	
		Replace		1.5					
	VALVE, TRAILER								
		Replace		0.5				1,2,3	
	VALVE, RELAY								
	VALVE, BRAKE, RELEASE	Replace		0.5				1,2,3	
		Replace		0.7				1,2,3	
13	WHEELS								
1311	WHEELS ASSEMBLY	Inspect	0.2						
		Replace	1.0					2,3	
1311	HUB AND DRUM	Inspect		0.3					
		Replace		1.5				1,2,3	
		Repair			2.0			4	
1311	BEARING WHEEL	Service		0.5					
		Inspect		0.3					
		Adjust		0.5				2,3	
		Replace		1.0				2,3	
1311	SEAL,WHEEL	Replace		1.0				2,3	
1313	TIRES	Inspect	0.1						
		Service	0.2						
		Repair			1.5			2,3	
		Replace		0.6				2,3	
15	FRAME AND TOWING								
1501	FRAME	Inspect	0.2	0.4					
		Repair				*		4,5,6	
1501	BUMPERS	Replace		0.2				1,2	
1501	POD STOPS	Inspect	0.1						
		Replace		0.3				2	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1)	(2)	(3)	(4)					(5)	(6)
			MAINTENANCE CATEGORY						
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT	TOOLS AND	
GROUP NO.	COMPONENT/ ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D	EQPT.	REMARKS
1503	SAFETY CHAINS	Inspect	0.1						
		Replace		0.3				1,2,3	
1503	COUPLING	Inspect	0.1					1,2,3	
		Replace		0.3					
1503	SPLL ADAPTER	Inspect	0.1						
1504	SPARE TIRE CARRIER	Inspect		0.3					
		Service		1.0				1,2,3	
		Replace		1.8				1,2,3	
1507	LANDING GEAR	Inspect	0.2						
		Service		0.2					
		Replace		0.1				1,2	
16	SPRINGS & SUSPENSION								
1601	SPRINGS AND LINERS	Inspect		0.1					
		Replace			2.0			4	
1601	U-BOLTS (One)	Replace			1.0			3	
1605	TORQUE RODS	Adjust			2.0			4	
		Replace			0.5				
18	BODY								
1801	GATES	Inspect	0.1						
		Replace	0.1					1,2,3	
		Repair			*10				
1805	FLOOR BOARDS	Inspect		0.2					
		Replace			*10			4	
22	ACCESSORIES								
2202	REFLECTORS	Inspect	0.1						
		Replace		0.3				1,2	
2210	DATA PLATES	Replace		0.3				2,3	

*Depends on extent of repair.

Section III. TOOLS AND TEST EQUIPMENT REQUIREMENTS

(1) REFERENCE CODE	(2) LEVEL MAINTENANCE	(3) NOMENCLATURE	(4) NATIONAL/NATO STOCK NUMBER	(5) TOOL NUMBER
1	O, F	TOOL KIT, GENERAL MECHANIC AUTO; SC 5180-90-CL-N26	5180-00-177-7033	W33004
2	O, F	SHOP EQUIPMENT, AUTO MAINT & REPAIR: ORG MAINT COMMON NO. 1 – LESS POWER; SC 4910-95-CL-A74	4910-00-754-0654	W32593
3	O, F	SHOP EQUIPMENT, AUTO MAINT & REPAIR: ORG COMMON NO. 2 – LESS POWER; SC 4910-95-CL-A72	4910-00-754-0650	W32730
4	F, H	SHOP EQUIPMENT, AUTO MAINT & REPAIR, FM BASIC, LESS POWER; SC 4910-95-CL-A31	4910-00-754-0705	T24660
5	F	SHOP EQUIPMENT, WELDING: FM; SC 3470-90-CL-A08	3470-00-357-7268	T16714
6	F	TOOL KIT, WELDERS; SC 5180-90-CL-N39	5180-00-754-0661	W58075
7	O	TIRE IRON, 52 IN. LG (2)	5120-01-170-5008	T47A
8	O	TIRE IRON, 36 IN. LG (1)	5120-01-171-8259	T46B
9	O	LOCKING JAW PLIERS	5120-00-494-1911	10R

Section IV. REMARKS

REFERENCE CODE	REMARKS
	NONE

APPENDIX C

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

Section I. INTRODUCTION

C-1. SCOPE

This appendix lists components of end item and basic issue items for the trailer to help you inventory items required for safe and efficient operation.

C-2. GENERAL

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

a. Section II. Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the trailer in operation, to operate it, and to perform emergency repairs. Although shipped separately, packaged BII must be with the trailer during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

a. Column (1) – Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

b. Column (2) – National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

c. Column (3) – Description. Indicates the National item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

d. Column (4) – Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr).

e. Column (5) – Quantity Required (Qty Rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

SECTION II. COMPONENTS OF END ITEM

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY RQR
		NONE			

SECTION III. BASIC ISSUE ITEMS

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY RQR
C-1	5995-00-038-3914	INTERVEHICULAR CABLE (19207) 7728812		EA	1
C-2	5120-01-170-4972	LUG WRENCH (TR1) (75204) 32501		EA	1
C-3	5120-01-170-4980	LUG WRENCH HANDLE (22271) A3800-941		EA.	1
C-4	4210-00-889-2221	FIRE EXTINGUISHER, TYPE BC (29743) PA-27BC W/D.B8-1		EA.	1
C-5	5340-01-089-4997	NUCLEAR TIEDOWN STRAP (19207) 11669588		EA.	8
		TIRE CHANGING BLOCK B7924 (NOT ILLUSTRATED) (APPENDIX G)		EA.	1
		TIRE MOUNTING PEDESTAL EX-1002 (NOT ILLUSTRATED) (APPENDIX G)		EA.	1

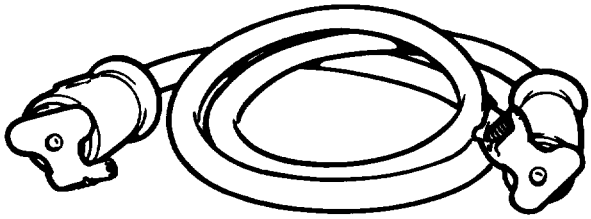


Figure C-1. Intervehicular Cable

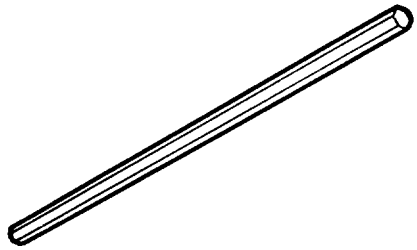


Figure C-3. Lug Wrench Handle

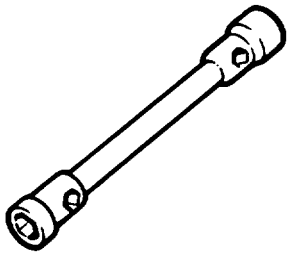


Figure C-2. Lug Wrench

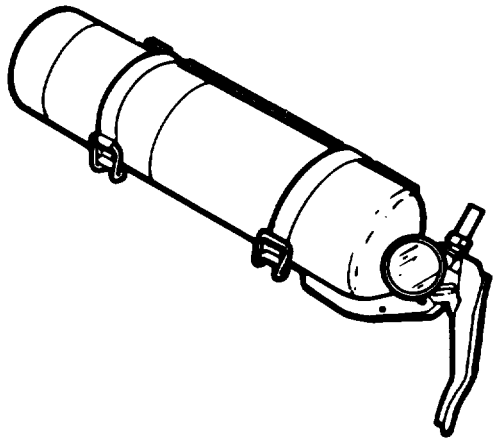
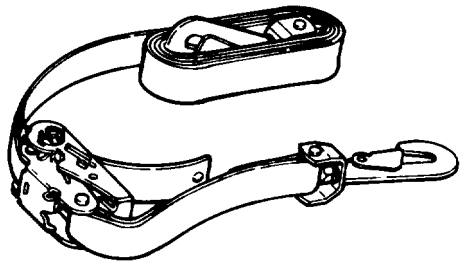


Figure C-4. Fire Extinguisher



TA252216

C-5. Nuclear Tiedown Strap

APPENDIX D

ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

D-1. SCOPE

This appendix lists additional items you are authorized for the support of the trailer.

D-2. GENERAL

This list identifies items that do not have to accompany the trailer and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

D-3. EXPLANATION OF LISTING

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

Section II. ADDITIONAL AUTHORIZATION LIST

(1) National Stock Number	(2) Description FSCM & Part Number		Usable On Code	(3) U/M	(4) Qty Auth
	3240	Torx Screwdriver Bit TX40 (Vermont American, Lincolnton, NC)		Ea.	1
		MTOE AUTHORIZED ITEMS NONE			
		CTA AUTHORIZED ITEMS NONE			

APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

E-1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the trailer. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

E-2. EXPLANATION OF COLUMNS

a. Column 1 – Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, app. E".)

b. Column 2 – Level. This column identifies the lowest level of maintenance that requires the listed item.

C Operator/Crew
O Organizational Maintenance
F Direct Support Maintenance
H General Support Maintenance

c. Column 3 – National Stock Number. This is the National Stock Number assigned to the item; use it to request or requisition the item.

d. Column 4 – Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

e. Column 5 – Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	C	6850-00-597-9765	CLEANING COMPOUND, SOLVENT 1-gal. (3.78-liter) can (81349) MIL-C 18718	GL
2	F	8010-01-160-6744	COATING POLYURETHANE Forest Green (81349) MIL-C-46168A	GL
3	O	6850-01-474-2302 6850-01-474-2309	CLEANING COMPOUND, SOLVENT (81349) MIL-PRF-680 1-gal. (3.78-liter) can 5-gal. (18.9-liter) can	 GL GL
4	C	9150-00-065-0029 9150-00-935-1017 9150-00-190-0904 9150-00-190-0907	GREASE, AUTOMOTIVE AND ARTILLERY: GAA (81349) MIL-G 10924 2-1/4 oz. (63.79-g) tube 14-oz. (396.89-g) cartridge 1-lb. (0.454-kg) can 35-lb. (15.89-kg) can	 OZ OZ LB LB
5	O	2640-00-256-5527	LUBRICANT, TIRE AND RIM (81349) 1-gal. (3.78 LITER) can	 GL
6	C	9150-00-189-6727 9150-00-186-6681	LUBRICANTING OIL, INTERNAL COMBUSTION ENGINE: OE (81349)MIL-L-2104 HDO10, 1-qt (0.95-liter) can HDO30, 1-qt (0.95-liter) can	 QT QT
7	O	9150-00-402-2372 9150-00-402-4478	LUBRICATING OIL, INTERNAL COMBUSTION ENGINE: subzero (81349) MIL-L-46167 1-qt (0.95-liter) can 5-gal.(18.92-liter) can	 QT GL
8	F	8010-00-264-8866	PRIMER COATING, EPOXY (81349) MIL-P-52192	GL
9	F	8010-00-229-4813	PRIMER COATING, EPOXY-POLYMIDE (81349) MIL-P-23377	GL

APPENDIX F
ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LISTS

Section I. INTRODUCTION

F-1. SCOPE

This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of Unit, Direct Support and General Support Maintenance of the HEMAT. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the source, maintenance and recoverability (SMR) codes.

F-2. GENERAL

In addition to Section 1. Introduction, this Repair Parts and Special Tools List is divided into the following sections:

a. Section II. **Repair Parts List.** A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed in item name sequence. Repair kits are listed separate] y in their own functional group within Section II. Repair parts for reparable special tools are also listed in the section. Items listed are shown on the associated illustration (s)/figure(s).

b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in DESCRIPTION AND USABLE ON CODE column) for the performance of maintenance.

c. Section IV. Cross-reference Indexes. A list, in National Item Identification Number (NIIN) sequence, of all National stock numbered items appearing in the listing, followed by a list in alphanumeric sequence of all part numbers appearing; in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance. The figure and item number index lists figure and item numbers in alphanumeric sequence and cross-references NSN, FSCM/CAGE, and part numbers.

F-3. EXPLANATION OF COLUMNS (SECTIONS II AND III)

a. ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration,

b. SMR CODE (Column (2)). The Source, Maintenance, and Recoverability (SMR) code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instructions, as shown in the following breakout:

Source Code

1st two positions XXxxx

How you get an item.

Maintenance Code

XXxxx

3d position — Who can install, replace, or use the item.

4th position — Who can do complete repair* on the item.

Recoverability Code

xxxxX **5th position**

Who determines disposition action on an unserviceable item.

Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

(1) Source Code. The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follows:

Code	Application/Explanation
PA *PB* *PC*** *PD* *PE* *PF* *PG*	Stocked items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the 3d position of the SMR code. * * Items coded PC are subject to deterioration.
KD *KF* *KB*	Items with these codes are not to be requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the 3d position of the SMR code. The complete kit must be requisitioned and applied.
MO- *(Made at UM/ AVUM Level)* *MF- (Made at DS/ AVUM Level)* *MH- (Made at GS Level)* *ML- (Made at Specialized Repair Activity (SRA))* *MD- (Made at Depot)*	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the Bulk Material group of the repair parts list in this RPSTL. If the item is authorized to you by the 3d position code of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.
AO-(Assembled by UM/AVUM Level) *AF- (Assembled by DS/AVIM Level)* *AH- (Assembled by GS Category)* *AL- (Assembled by SRA)* *AD-(Assembled by Depot)*	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicted by the source code. If the 3d position code of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.
XA -	Do not requisition an " XA" -coded item. Order its next higher assembly. (Also refer to the NOTE following.)
XB -	If an " XB" item is not available from salvage, order it using the FSCM/CAGE and part number given.
XC -	Installation drawing, diagram, instruction sheet, field service drawing, that is identified by the manufacturer's part number.
XD -	Item is not stocked. Order an " XD" -coded item through normal supply channels using the FSCM/CAGE and part number given, if no NSN is available,

NOTE: Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded " XA" or those aircraft support items restricted by requirements of AR 700-42.

(2) **Maintenance Code.** Maintenance codes tell you the level(s) of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

(a) The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to one of the following levels of maintenance,

Code	Application/Explanation
c -	Crew or operator maintenance done within unit maintenance or aviation unit maintenance.
o -	Unit maintenance or aviation unit category can remove, replace, and use the item.
F -	Direct support or aviation intermediate level can remove, replace, and use the item.
H -	General support level can remove, replace, and use the item.
L -	Specialized repair activity can remove, replace, and use the item.
D -	Depot level can remove, replace, and use the item.

(b) The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (i. e., perform all authorized repair functions). (NOTE: Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.) This position will contain one of the following maintenance codes:

Code	Application/Explanation
O -	Unit maintenance or aviation unit is the lowest level that can do complete repair of the item.

F - Direct support or aviation intermediate is the lowest level than can do complete repair of the item.

H - General support is the lowest level that can do complete repair of the item.

L - Specialized repair activity is the lowest level that can do complete repair of the item.

D - Depot is the lowest level that can do complete repair of the item.

Z - Nonreparable. No repair is authorized.

B - No repair is authorized. (No parts or special tools are authorized for the maintenance of a "B"-coded item.) However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

(3) Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR code as follows:

Code	Application/Exp lanation
Z -	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the 3d position of the SMR code.
O -	Reparable item. When uneconomically reparable, condemn and dispose of the item at unit maintenance or aviation unit level.
F -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support or aviation intermediate level.
H -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
D -	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.
L -	Reparable item. Condemnation and disposal of item not authorized below specialized repair activity (SRA).
A -	Item requires special handling or condemnation procedures because of specific reasons (e. g., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. FSCM/CAGEC (Column (3)). The Federal Supply Code for Manufacturer (FSCM)/Commercial and Government Entity (CAGE) Code (C) is a 5-digit alphanumeric code which is used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

d. PART NUMBER (Column (4)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

NOTE: When you use an NSN to requisition an item, the item you receive may have a different part number from the part ordered.

e. DESCRIPTION AND USABLE ON CODE (UOC) (Column (5)). This column includes the following information:

(1) The Federal item name and, when required, a minimum description to identify the item.

(2) Physical security classification. Not Applicable.

(3) Items that are included in kits and sets are listed below the name of the kit or set on Figure KIT.

(4) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.

(5) Part numbers for bulk materials are referenced in this column in the line item entry for the item to be manufactured/fabricated.

(6) When the item is not used with all serial numbers of the same model, the effective serial numbers are shown on the last line(s) of the description (before UOC).

(7) The usable on code, when applicable (see paragraph 5, Special Information). Not Applicable.

(8) In the Special Tools List section, the basis of issue (BOI) appears as the last line(s) in the entry for each special tool, special TMDE, and other special support equipment. When density of equipments supported exceeds density spread indicated in the basis of issue, the total authorization is increased proportionately.

(9) The statement " END OF FIGURE" appears just below the last item description in Column 5 for a given figure in both Section H and Section III.

f. QTY (Column (6)). The QTY (quantity per figure column) indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column

in lieu of a quantity indicates that the quantity is variable and the quantity may vary from application to application.

F-4. EXPLANATION OF COLUMNS (SECTION IV)

a. NATIONAL STOCK NUMBER (NSN) INDEX.

(1) STOCK NUMBER column. This column lists the NSN by National Item Identification Number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN (i.e., 5305-01-674-1467). When using this column to locate an item, ignore the first 4 digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

(2) FIG. column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in Section II and Section III.

(3) ITEM column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

b. PART NUMBER INDEX. Part numbers in this index are listed by part number in ascending alphanumeric sequence (i. e., vertical arrangement of letter and number combination which places the first letter or digit of each group in order A through Z, followed by the numbers O through 9 and each following letter or digit in like order).

(1) FSCM/CAGEC column, The Federal Supply Code for Manufacturer (FSCM)/Commercial and Government Entity (CAGE) Code (C) is a 5-digit alphanumeric code used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

(2) PART NUMBER column. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

(3) STOCK NUMBER column. This column lists the NSN for the associated part number and manufacturer identified in the PART NUMBER and FSCM/CAGEC columns to the left.

(4) FIG. column. This column lists the number of the figure where the item is identified/located in Section II and III.

(5) ITEM column. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column,

c. FIGURE AND ITEM NUMBER INDEX,

(1) FIG. column. This column lists the number of the figure where the item is identified/located in Sections H and 111.

(2) ITEM column. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

(3) STOCK NUMBER column. This column lists the NSN for the item.

(4) FSCM/CAGEC column. The Federal Supply Code for Manufacturer (FSCM)/Commercial and Government Entity (CAGE) Code (C) is a 5-digit alphanumeric code used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

(5) PART NUMBER column. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards and inspection require- ments to identify an item or range of items.

F-5. SPECIAL INFORMATION

a. USABLE ON CODE. The usable on code appears in the lower left corner of the Description column heading. Usable on codes are shown as "UOC: . . . . . " in the Description column (justified left) on the first line following applicable item description/nomenclature. Not Applicable.

b. FABRICATION INSTRUCTIONS. Bulk materials required to manufacture items are listed in the Bulk Material Functional Group of this RPSTL. Part numbers for bulk materials are also referenced in the Description column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in Appendix G of this manual,

c. ASSEMBLY INSTRUCTIONS. Detailed assembly instructions for items source coded to be assembled from component spare/repair parts are found in Chapters 4 and 5 of this manual Items that make up the assembly are listed immediately following the assembly item entry or reference is made to an applicable figure.

d. KITS. Line item entries for repair parts kits appear in group 9401 in Section II. Not Applicable.

e. INDEX NUMBERS. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the National Stock Number/Part Number Index and the bulk material list in Section II.

f. ASSOCIATED PUBLICATIONS. Not Applicable.

F-6. HOW TO LOCATE REPAIR PARTS

a. When National Stock Number or Part Number is Not Known:

(1) First. Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.

(2) Second. Find the figure covering the assembly group or subassembly group to which the item belongs.

(3) Third. Identify the item on the figure and use the Figure and Item Number Index to find the NSN.

b. When National Stock Number or Part Number is Known:

(1) First. Using the National Stock Number or Part Number Index, find the pertinent National Stock Number or Part Number. The NSN index is in National Item Identification Number (NIIN) sequence (see paragraph 4 .a. (1)). The part numbers in the Part Number index are listed in ascending alphanumeric sequence (see paragraph 4.b). Both indexes cross-reference you to the illustration/figure and item number of the item you are looking for.

(2) Second. Turn to the figure and item number, verify that the item is the one you're looking for, then locate the item number in the repair parts list for the figure.

F-7. ABBREVIATIONS

For standard abbreviations see MIL-STD-12D, Military Standard Abbreviations for Use on Drawings, Specifications, Standards, and in Technical Documents.

Abbreviations	Explanation
NIIN	National Item Identification Number (consists of the last 9 digits of the NSN)
RPSTL	Repair Parts and Special Tools List

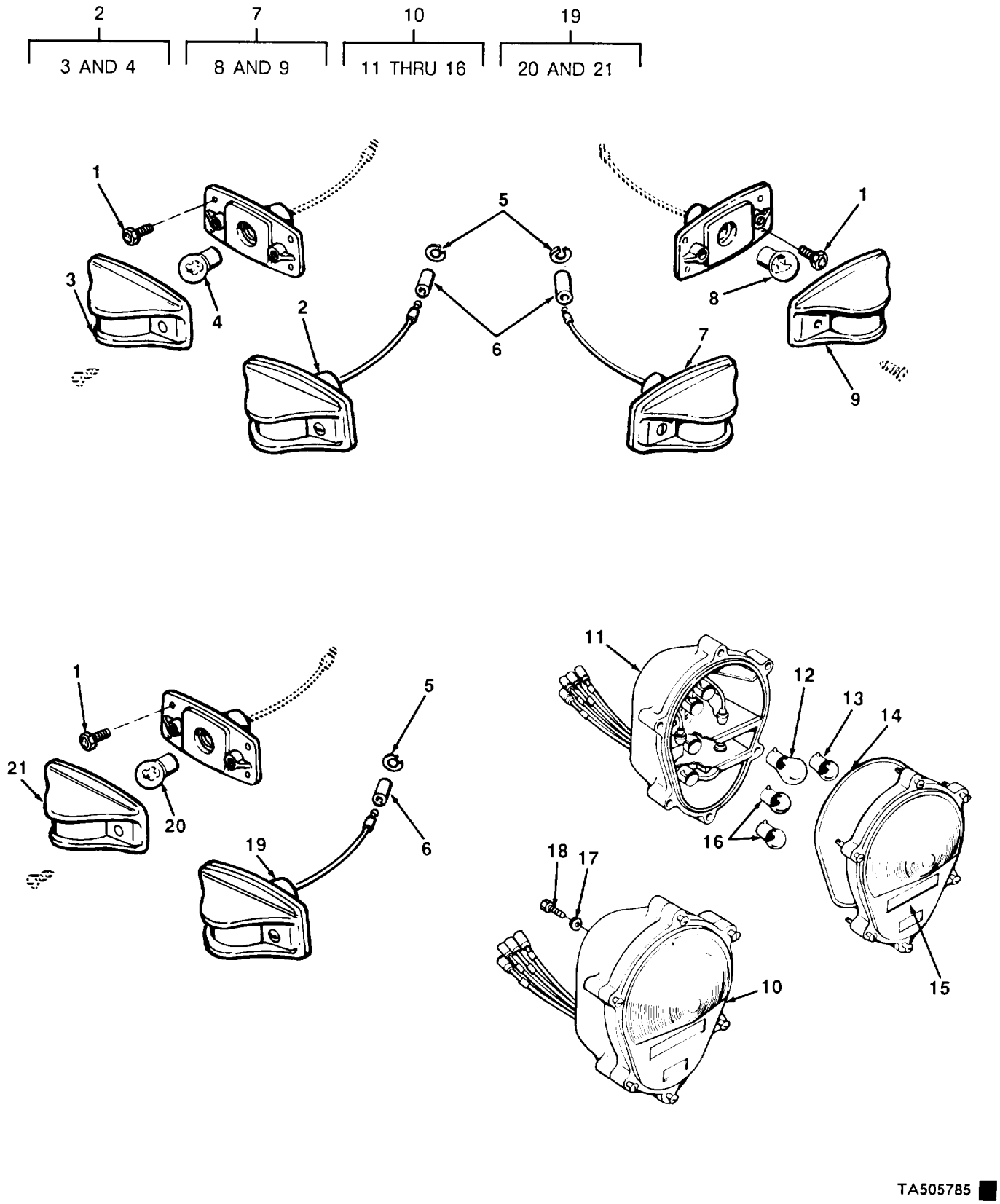


FIGURE 1. LIGHTS.

	(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
					GROUP 06 ELECTRICAL SYSTEM	
					GROUP 0609 LIGHTS	
					FIG. 1 LIGHTS	
	1	PAOZZ	96906	MS51851-45	SCREW,TAPPING,THREA	30
	2	PAOOO	96906	MS35423-1	LIGHT,MARKER,CLEARA AMBER	6
	3	PAOZZ	96906	MS35421-1	.LENS,LIGHT	1
	4	PAOZZ	96906	MS15570-1251	.LAMP,INCANDESCENT	1
	5	PAOZZ	51831	8338567	WASHER,SLOTTER	15
	6	PAOZZ	51831	8338566	SHELL,ELECTRICAL CO	15
	7	PAOOO	96906	MS35423-2	LIGHT,MARKER,CLEARA RED	7
	8	PAOZZ	96906	MS15570-1251	.LAMP,INCANDESCENT	1
	9	PAOZZ	96906	MS35421-2	.LENS,LIGHT	1
	10	PAOOO	96906	MS52125-2	STOP LIGHT-TAILLIGH COMPOSITE	2
*	11	XAOZZ	19207	11639520	.BODY ASSEMBLY	1
	12	PAOZZ	96906	MS15570-89	.LAMP,INCANDESCENT	1
	13	PAOZZ	96906	MS35478-1073	.LAMP,INCANDESCENT	1
	14	PAOZZ	19207	11639519-2	.PACKING,PREFORMED	1
	15	PAOZZ	19207	11639535	.LENS,LIGHT	1
	16	PAOZZ	96906	MS15570-1251	.LAMP,INCANDESCENT	2
	17	PAOZZ	96906	MS35338-46	WASHER,LOCK	4
	18	PAOZZ	96906	MS18154-58	SCREW,CAP,HEXAGON H	4
	19	PAOOZ	96906	MS35424-1	LIGHT,MARKER,CLEARA BLACKOUT	2
	20	PAOZZ	96906	MS15570-1251	.LAMP,INCANDESCENT	1
	21	PAOZZ	96906	MS35420-1	.LENS,LIGHT	1
					END OF FIGURE	

6
7 THRU 9

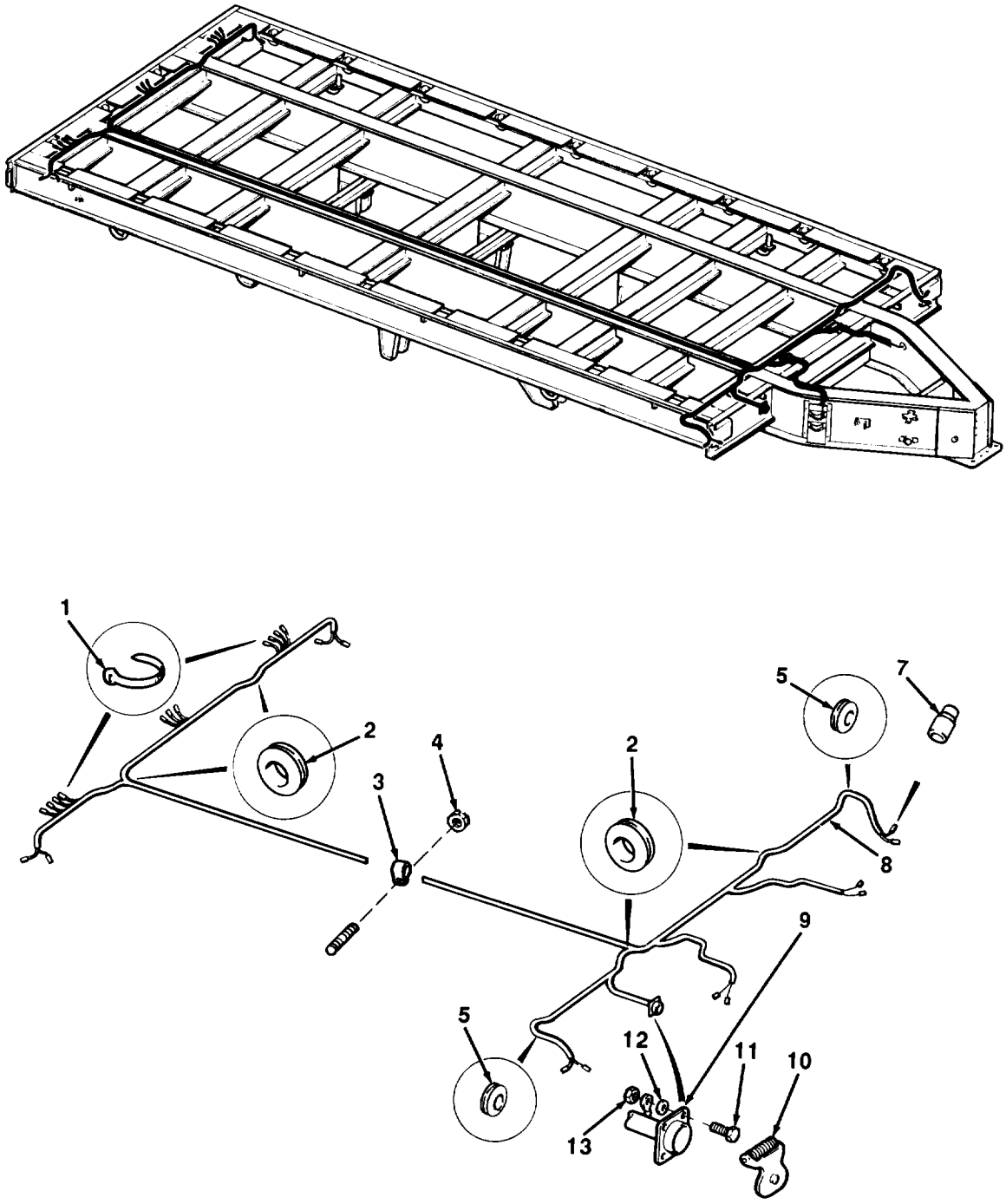


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FIGURE 2. WIRING HARNESS AND CABLE.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 0613 HULL OR CHASSIS WIRING HARNESS	
				FIG. 2 WIRING HARNESS AND CABLE	
1	PAOZZ	06383	PLT3I	STRAP, TIEDOWN, ELECT	2
2	PAOZZ	96906	MS35489-114	GROMMET, NONMETALLIC	4
3	PAOZZ	75272	COV-1509	CLAMP, LOOP	20
4	PAOZZ	90763	D0142095-EBG	NUT, STAMPED	20
5	PAOZZ	70485	2570	GROMMET, NONMETALLIC	4
6	PBOOO	22271	7901	WIRING HARNESS, BRAN	1
7	PAOZZ	96906	MS27144-2	.CONNECTOR, PLUG, ELEC	23
8	MFFZZ	22271	9023-500	.HARNESS, MAIN MAKE FROM PART NO. M-13486/1-5	1
*9	PAOZZ	96906	MS75021-1	.CONNECTOR, RECEPTACLE	1
10	PAOZZ	19207	7731428	COVER, ELECTRICAL CO	1
11	PAOZZ	96906	MS90725-6	SCREW, CAP, HEXAGON H	4
12	PAOZZ	96906	MS35338-44	WASHER, LOCK	1
13	PAOZZ	81349	M45913/1-4CG5C	NUT, SELF-LOCKING, HE	4

END OF FIGURE

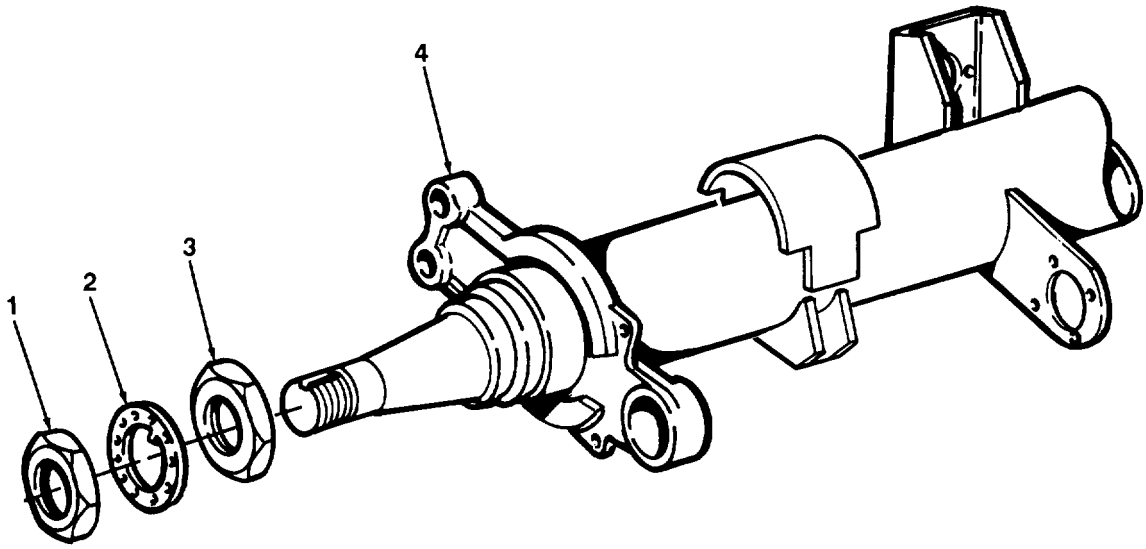

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FIGURE 3, AXLE,

	(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
					GROUP 11 REAR AXLE	
					GROUP 1100 REAR AXLE ASSEMBLY	
					FIG. 3 AXLE	
*	1	PAFZZ	22271	10408	.NUT,PLAIN,HEXAGON	2
*	2	PAFZZ	97271	10409	.WASHER,KEYWAY	2
*	3	PAFZZ	22271	10406	.NUT,PLAIN,OCTAGON	2
*	4	PBFZZ	22271	C9005-361	.AXLE,VEHICULAR,NOND	1
					END OF FIGURE	

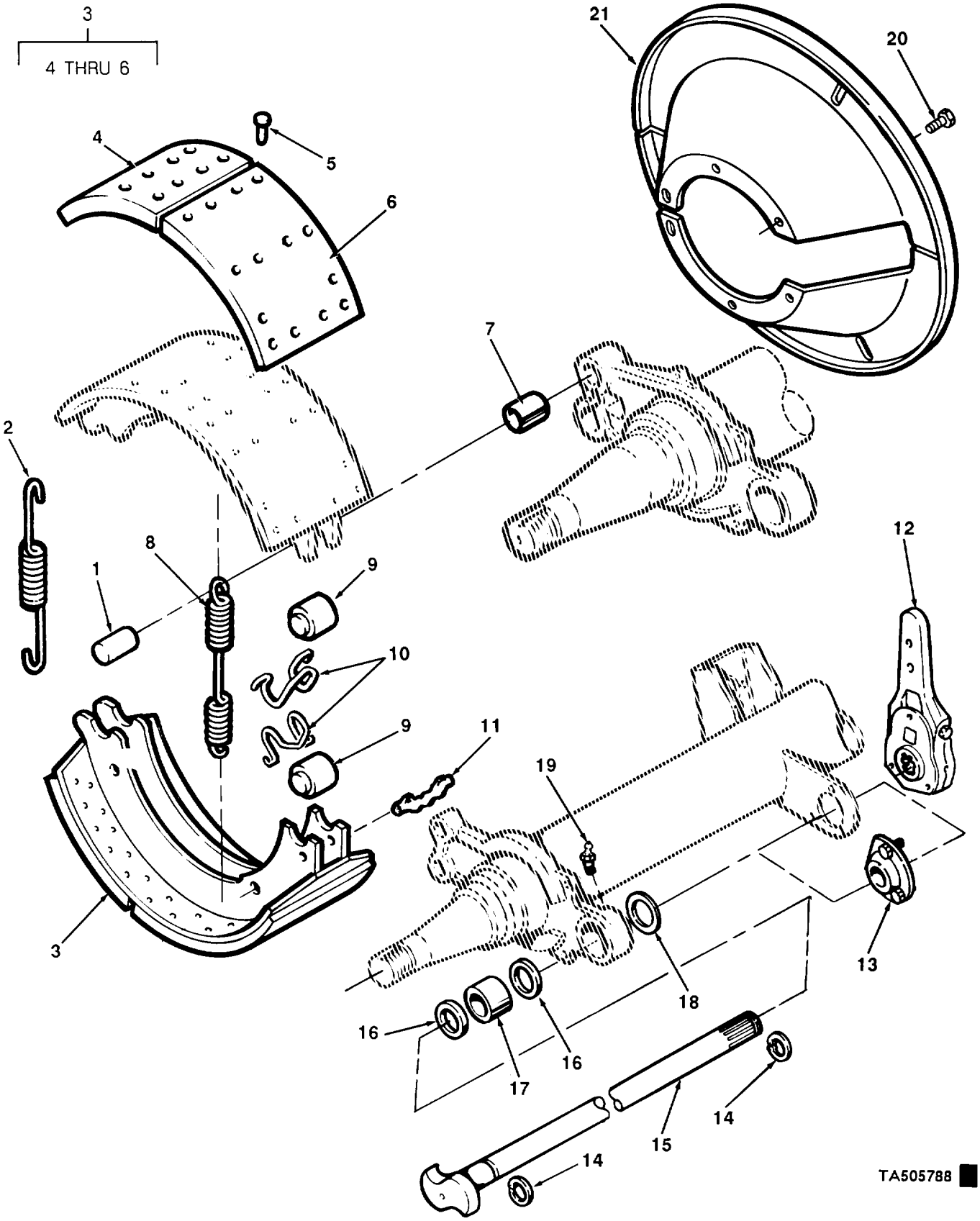

FIGURE 4. SERVICE BRAKES.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 12 BRAKES	
				GROUP 1202 SERVICES BRAKES	
				FIG. 4 SERVICE BRAKES	
1	PAOZZ	22271	16355	PIN,SHOULDER,HEADLE	4
2	PAOZZ	62707	M16WJ101	SPRING,HELICAL,EXTE	2
*3	PAOFF	97271	16130	BRAKE SHOE	4
*4	PAFZZ	22271	16567	.LINING,FRICTION	4
*5	PAFZZ	22271	M10HM100	.RIVET,TUBULAR	96
*6	PAFZZ	22271	16566	.LINING,FRICTION	4
7	PAOZZ	22271	16034	BUSHING,SLEEVE	4
8	PAOZZ	22271	16101	SPRING,HELICAL,EXTE	2
*9	PAOZZ	30516	1Z6152	ROLLER	8
*10	PAOZZ	97271	M16WJ103	SPRING,BRAKE ROLLER RETAINING	4
11	PAOZZ	22271	16361	PIN,RETURN SPRING	4
12	PAOZZ	22271	16343	ADJUSTER,SLACK,BRAK	2
13	PAOZZ	22271	9008-555	PARTS KIT,BEARING , CAMSHAFT	2
14	PAOZZ	96906	MS16624-1150	RING,RETAINING	4
*15	PAOZZ	97271	M16WKR10-236	CAMSHAFT,ACTUATING, RIGHT	1
*15	PAOZZ	97271	M16WKL10-236	CAMSHAFT,ACTUATING, LEFT	1
16	PAOZZ	22271	16055	SEAL,PLAIN ENCASED	4
17	PAOZZ	22271	16033	BUSHING,SLEEVE	2
18	PAOZZ	22271	16029	WASHER,FLAT	2
19	PAOZZ	96906	MS15003-4	FITTING,LUBRICATION	2
20	PAOZZ	22271	M10HM115	SCREW,TAPPING THREA	12
*21	PAOZZ	62707	M16WB100	SHIELD,BRAKE DISK	2
				END OF FIGURE	

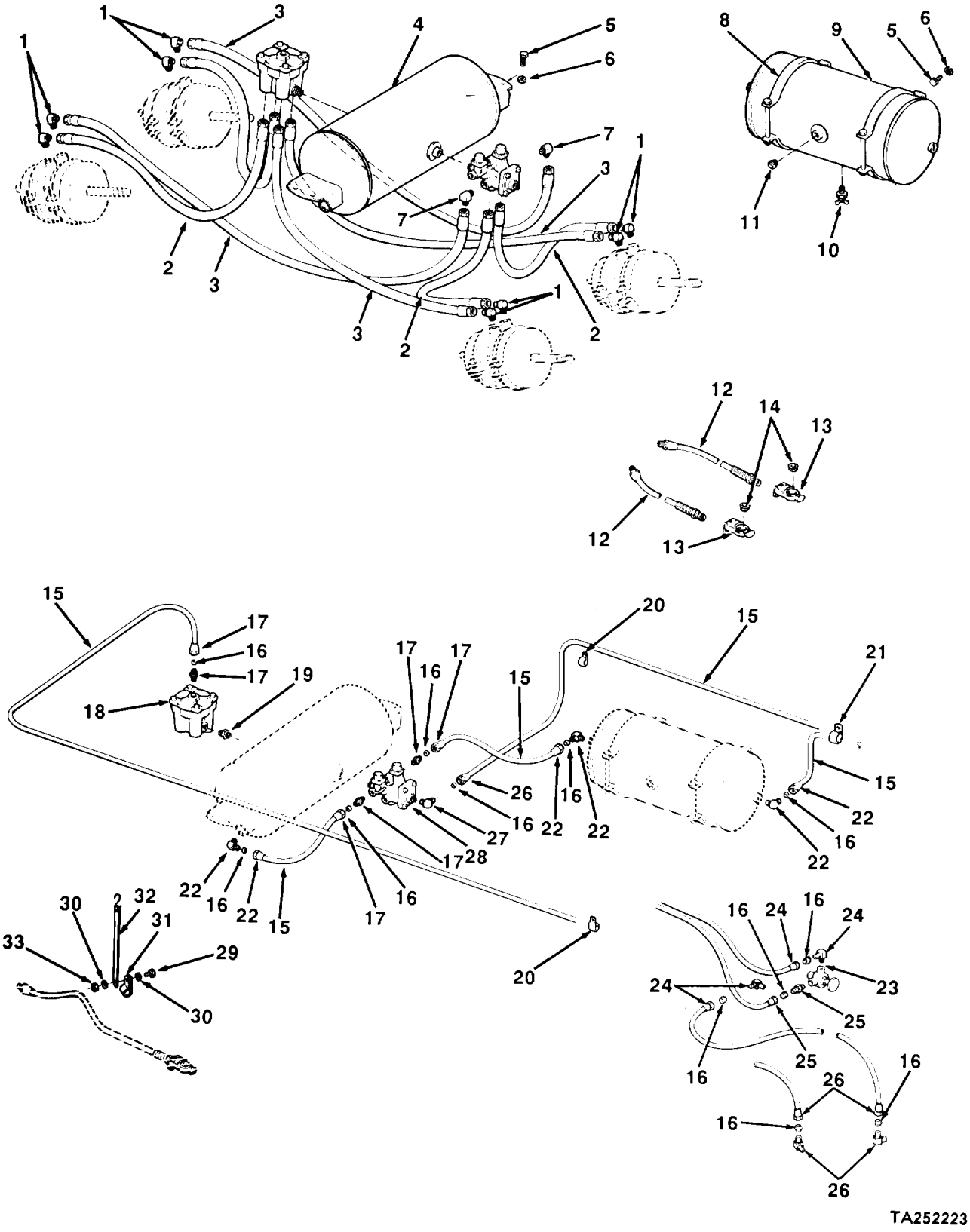

FIGURE 5. AIR BRAKE SYSTEM.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 1208 AIRBRAKE SYSTEM	
				FIG. 5 AIRBRAKE SYSTEM	
1	PAOZZ	79470	C5405X8	ELBOW,TUBE	8
2	PAOZZ	22271	B2600-942	HOSE ASSEMBLY,NONME	4
3	PAOZZ	80000	B2600-943	HOSE ASSEMBLY,NONME	4
4	PAOZZ	22271	2500-915	TANK,PRESSURE	1
5	PAOZZ	81349	B1821BH038C100D	SCREW,CAP,HEXAGON H	8
6	PAOZZ	96906	MS35649-2382	NUT,PLAIN,HEXAGON	8
7	PAOZZ	79146	61K-8-6	ELBOW,PIPE	2
8	PFOZZ	82722	221399	STRAP,RETAINING	2
9	PAOZZ	22271	2500-916	TANK,PRESSURE	1
10	PAOZZ	79146	56D-4	COCK,POPPET DRAIN	2
11	PAOZZ	96906	MS20913-6S	PLUG,PIPE	1
12	PAOZZ	22271	B2600-944	HOSE ASSEMBLY,NONME	1
13	PAOZZ	58536	A52484-1	COUPLING HALF,QUICK	2
14	PAOZZ	96906	MS35748-1	PACKING,PREFORMED	2
15	PAOZZ	13174	C606	HOSE,NONMENTALLIC	43
16	PAOZZ	79146	HO-159-6	INSERT,TUBE FITTING	12
17	PAOZZ	16662	AC2569	COUPLING,TUBE	3
18	XDOZZ	06853	102276	VALVE,RELAY	1
19	PAOZZ	79146	61T-G-12X8	REDUCER,PIPE	1
20	PAOZZ	75272	COV-070921	HOOK,SUPPORT	16
21	PAOZZ	18076	S325-G14	CLAMP,LOOP	5
22	PAOZZ	0EAK3	SK-6006-3	ELBOW,TUBE TO BOSS	3
23	PAOZZ	06853	7012-21	VALUE,BRAKE	1
24	PAOZZ	22271	2605-150	ELBOW,TUBE	2
25	PAOZZ	93061	68AB-6-2	ADAPTER,STRAIGHT,PI	1
26	PAOZZ	96906	MS39182-5	ELBOW,PIPE TO TUBE	2
27	PAOZZ	81343	6-4 100202BA(LONG NUT)	ELBOW,PIPE TO TUBE	1
28	PAOZZ	06853	101112	VALVE,VACUUM REGULA	1
29	PAOZZ	96906	B1821BH025C100D	SCREW,CAP,HEXAGON H	1
30	PAOZZ	96906	MS27183-3	WASHER,FLAT	1
31	XDOZZ	22271	2360-442	STRAP,RETAINING	1
32	PAOZZ	22271	3800914	STRAP,RUBBER	1
*33	PAOZZ	22271	3617-084	NUT,SELF-LOCKING,HE	1
				END OF FIGURE	

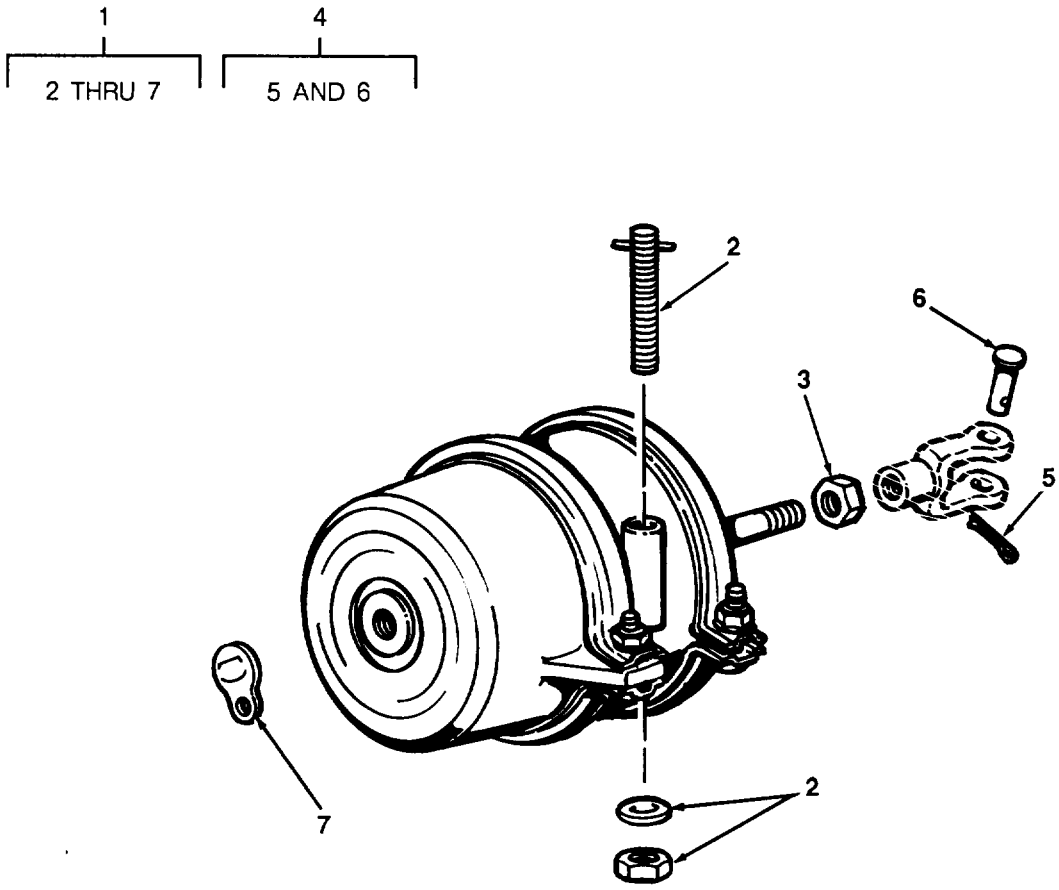

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FIGURE 6. AIR BRAKE CHAMBER.

	(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
					GROUP 1208 AIRBRAKE SYSTEM	
					FIG. 6 AIRBRAKE CHAMBER	
*	1	PAOOO	50153	163046	CHAMBER,AIR BRAKE	4
	2	PAOZZ	50153	11M011	.STUD ASSEMBLY,RELEA	1
	3	PAOZZ	96906	MS51968-20	.NUT,PLAIN,HEXAGON	1
*	4	PAOOO	50153	11M018-1/2	.CLEVIS,ROD END	1
	5	PAOZZ	96906	MS24665-387	..PIN,COTTER	1
	6	PAOZZ	50153	11M061	..PIN,STRAIGHT,HEADED	1
	7	PAOZZ	50153	11M012	.PLUG,CHAMBER TOP	1
					END OF FIGURE	

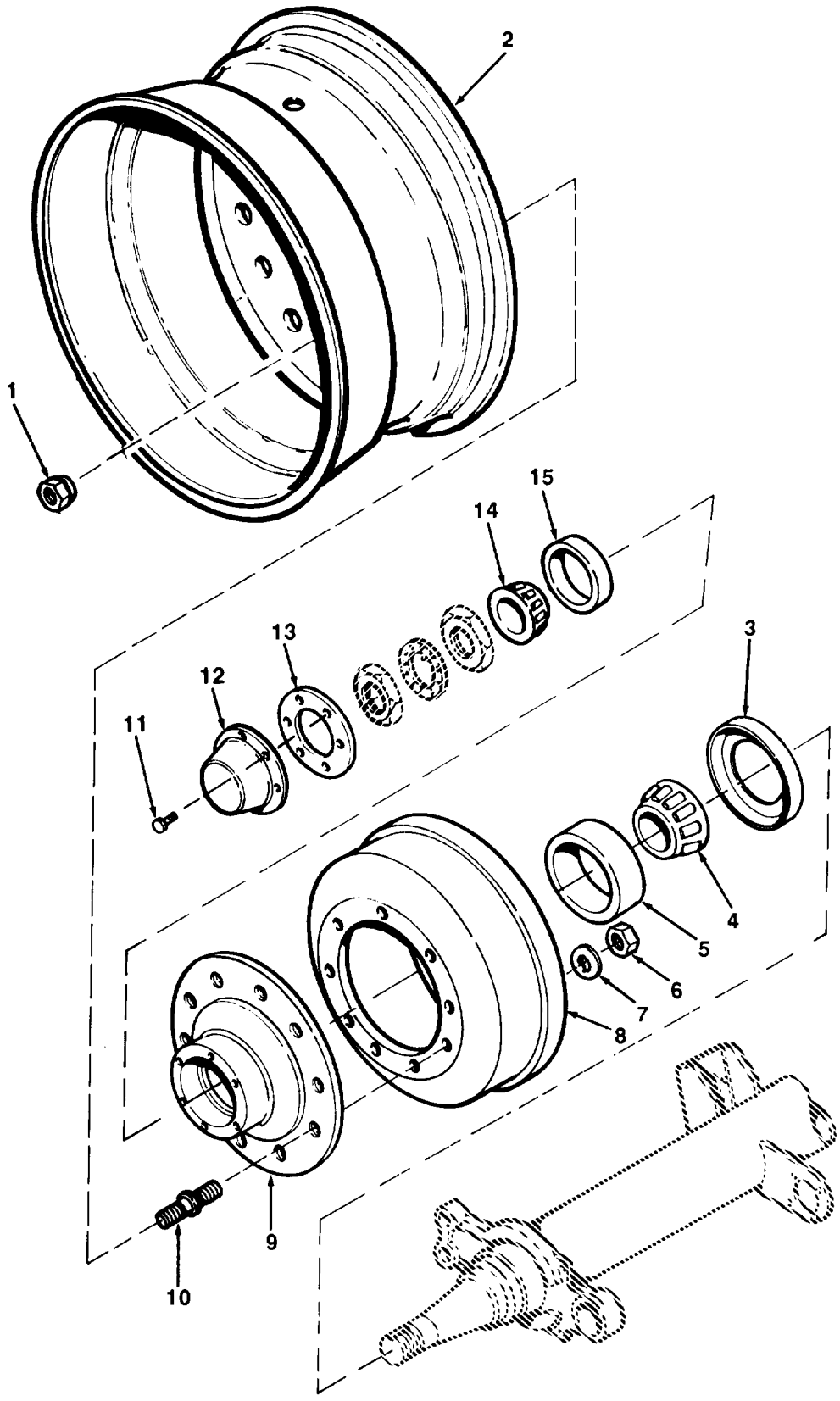

FIGURE 7. WHEELS AND HUBS.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 13 WHEELS AND TRACKS	
				GROUP 1311 WHEEL ASSEMBLY	
				FIG. 7 WHEELS AND HUBS	
1	PACZZ	09386	37889	NUT,PLAIN,SINGLE BA LEFT	20
1	PACZZ	09386	37888	NUT,PLAIN,SINGLE BA RIGHT	20
2	PCOZZ	22337	RA-27970	WHEEL,PNEUMATIC TIR	5
*3	PAOZZ	80201	40136	.SEAL,PLAIN ENCASED	2
*4	PAOZZ	60038	663	CONE AND ROLLERS,TA	2
*5	PAOZZ	60038	653	CUP,TAPERED ROLLER	2
*6	PAOZZ	22271	10151	NUT,SELF-LOCKING,HE	20
*7	PAOZZ	96906	MS27183-23	WASHER,FLAT	20
*8	PAOFF	22271	16258	BRAKE DRUM	2
*9	PAOOO	22271	K21-HQ104	HUB,BODY	2
*10	PAOZZ	09386	95693	.STUD,SHOULDERED RIGHT	10
*10	XDOZZ	09386	95694	.STUD,SHOULDERED LEFT	10
*11	PAOZZ	22271	M10HM15	.SCREW,TAPPING,THREA	12
*12	PAOZZ	22271	10070	.COVER,ACCESS	2
*13	PAOZZ	62707	M10HG108	.GASKET,HUB CAP	2
*14	PAOZZ	60038	HM212049	.CONE AND ROLLERS,TA	2
*15	PAOZZ	60038	HM212011	.CUP,TAPERED ROLLER	2

END OF FIGURE

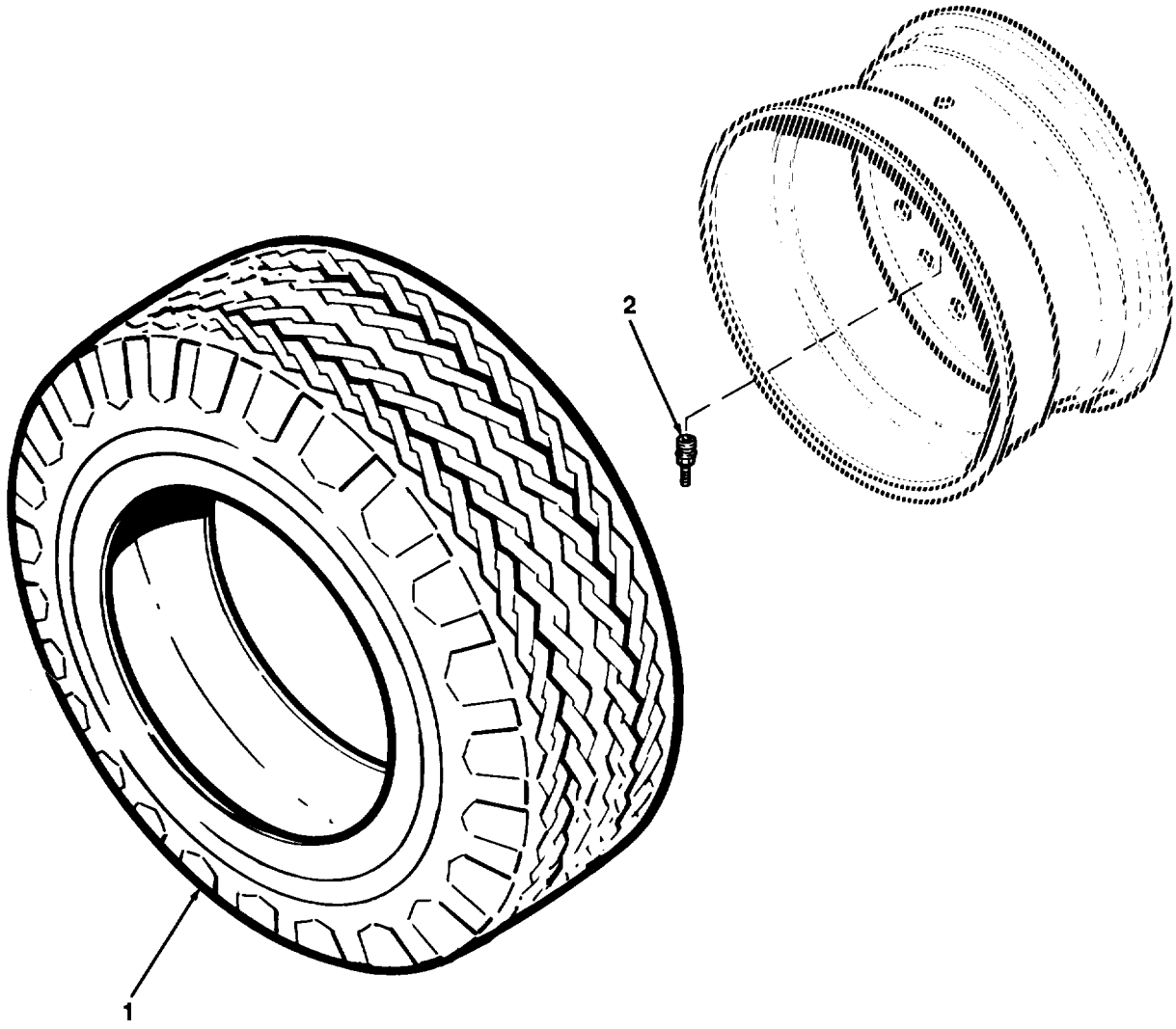

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FIGURE 8. TIRES.

	(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
					GROUP 1313 TIRES, TUBES, TIRE CHAINS	
					FIG. 8 TIRES	
*	1	PAOFF	81348	ZZ-T-381/15-9.5/ P3A/G/TBHR	TIRE,PNEUMATIC	5
	2	PAOZZ	96906	MS51368-2	VALVE,PNEUMATIC TIR	5
					END OF FIGURE	

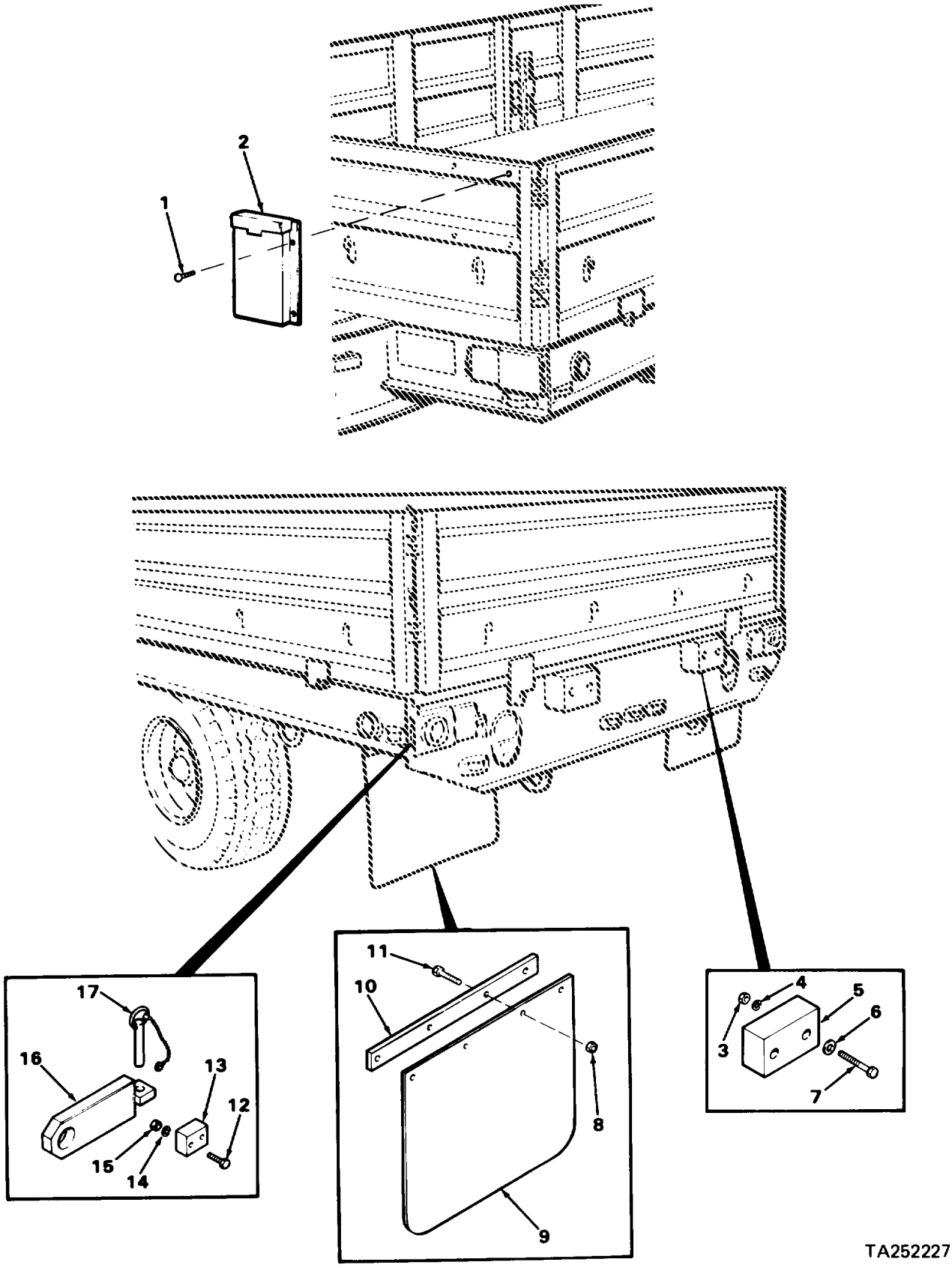

Figure 9. Frame Components (Sheet 1 of 2)

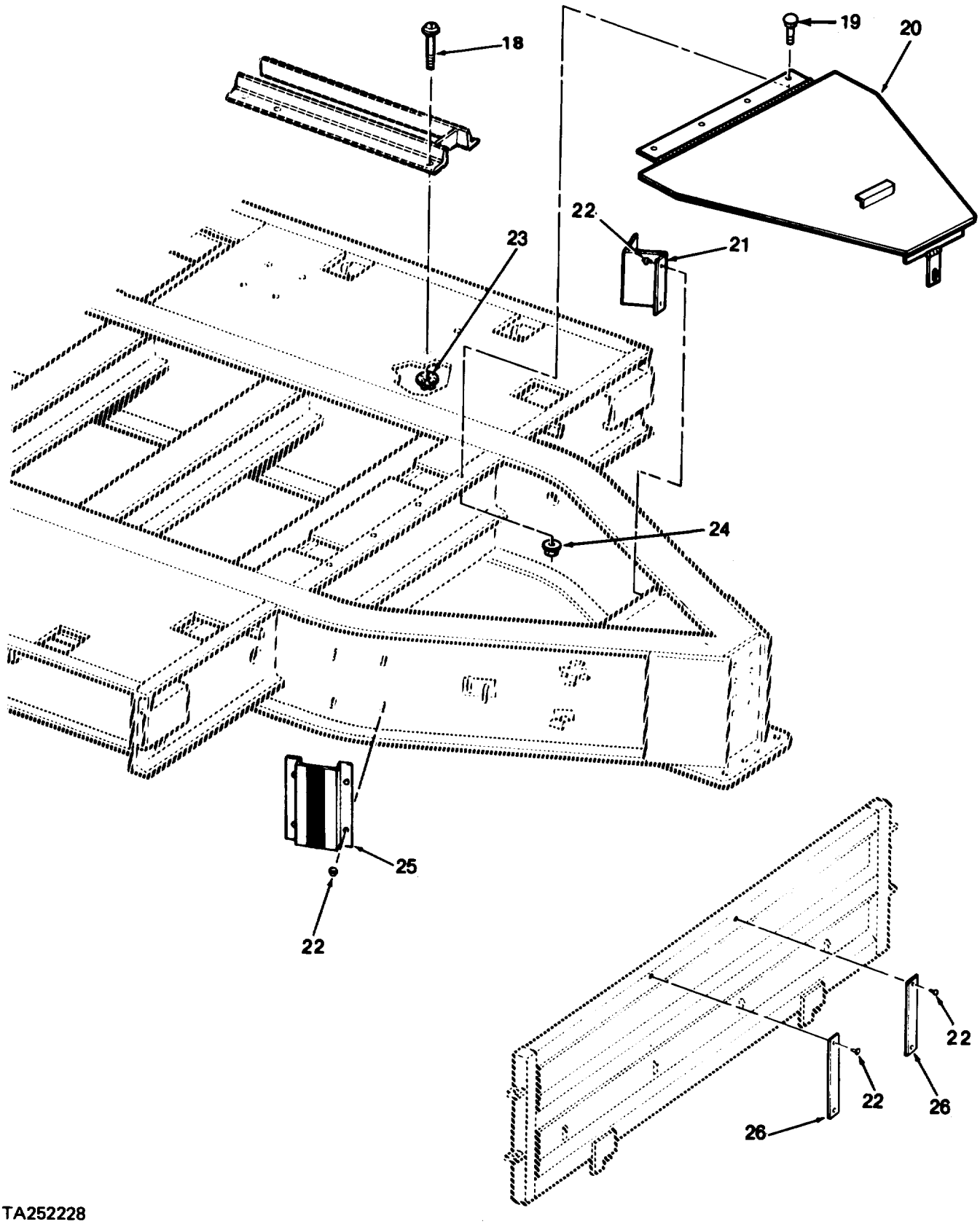

Figure 9. Frame Components (Sheet 2 of 2)

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 15 FRAME, TOWING ATTACHMENTS, DRAWBARS, AND ARTICULATION SYSTEMS	
				GROUP 1501 FRAME ASSEMBLY	
				FIG. 9 FRAME COMPONENTS	
1	PAOZZ	96906	MS51851-66	SCREW,TAPPING,THREA	6
2	PAOZZ	22271	3800-924	HOLDER,MANIFEST	1
3	PAOZZ	96906	MS51967-14	NUT,PLAIN,HEXAGON	4
4	PAOZZ	02978	ERNA245	WASHER,LOCK	4
5	PAOZZ	22271	430000	BUMPER,RUBBER	2
6	PAOZZ	96906	MS27183-19	WASHER,FLAT	4
7	PAOZZ	96906	MS90725-117	SCREW,CAP,HEXAGON H	4
8	PAOZZ	96906	MS35691-9	NUT,PLAIN,HEXAGON	8
9	PAOZZ	22271	C3800-925	GUARD,SPLASH,VEHICU	2
10	PAOZZ	22271	C6260-535	SPACER,PLATE	2
11	PAOZZ	96906	MS90725-36	BOLT,MACHINE	8
12	PAOZZ	96906	MS90725-18	SCREW,CAP,HEXAGON H	8
13	XDOZZ	22271	A6200-903	BLOCK,LOCKING PIN	4
14	PAOZZ	96906	MS35338-44	WASHER,LOCK	8
15	PAOZZ	96906	MS35649-2252	NUT,PLAIN,HEXAGON	8
16	PFOZZ	22271	B9916	EYE,LIFTING	4
17	PAOZZ	22271	A7909	PIN,QUICK RELEASE	4
18	PAOZZ	22271	3600-917	SCREW,CAP,SOCKET HE	24
19	PAOZZ	22271	3608-504	BOLT,SQUARE NECK	2
20	PFOZZ	22271	D9934	DOOR,ACCESS	1
21	PAOZZ	22271	A5200-934	BRACKET,ANGLE	2
22	PAOZZ	96906	MS51851-45	SCREW,TAPPING,THREA	4
23	PAOZZ	22271	3600-916	NUT,SERRATED FLANGE	24
* 24	PAOZZ	22271	3617-089	NUT FLANGED	2
25	PAOZZ	22271	B5200-932	BRACKET,CLEARANCE LIGHT MOUNTING	2
26	PAOZZ	22271	A6260-211	STRIP,JACKKNIFE	2
				END OF FIGURE	

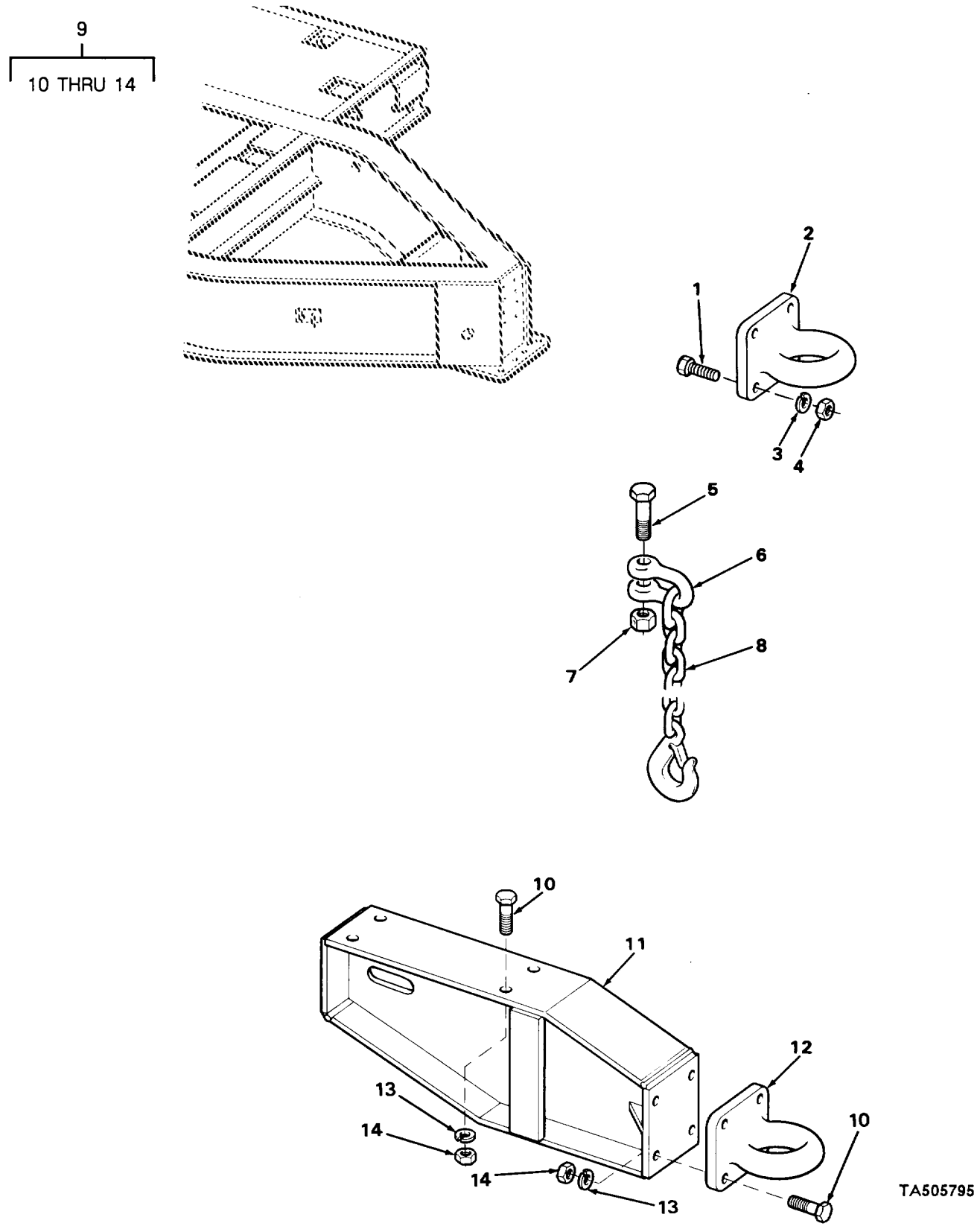

FIGURE 10. SAFETY CHAINS AND COUPLERS.

	(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
					GROUP 1503 PINTLES AND TOWING ATTACHMENTS	
					FIG. 10 SAFETY CHAINS AND COUPLER	
	1	PAOZZ	96906	MS90727-189	SCREW,CAP,HEXAGON H	4
	2	PAOZZ	74410	DB-1385	COUPLER,DRAWBAR	1
	3	PAOZZ	96906	MS35338-51	WASHER,LOCK	4
	4	PAOZZ	96906	MS51968-23	NUT,PLAIN,HEXAGON	4
	5	PAOZZ	96906	MS90728-215	SCREW,CAP,HEXAGON H	2
	6	PAOZZ	75535	G215	SHACKLE	2
	7	PAOZZ	96906	MS35691-65	NUT,PLAIN,HEXAGON	2
	8	PAOZZ	22271	C3810-230	CHAIN ASSEMBLY,SING	2
*	9	PBOOO	8W862	D-7544	DRAWBAR ASSEMBLY	1
	10	PAOZZ	96906	MS90727-189	.SCREW,CAP,HEXAGON H	8
	11	XDOZZ	22271	D7545	.BEAM,SPLL ADAPTER	1
	12	PAOZZ	74410	DB-1385	.COUPLER,DRAWBAR,RIN	1
	13	PAOZZ	96906	MS35338-51	.WASHER,LOCK	8
	14	PAOZZ	96906	MS51968-23	.NUT,PLAIN,HEXAGON	8
					END OF FIGURE	

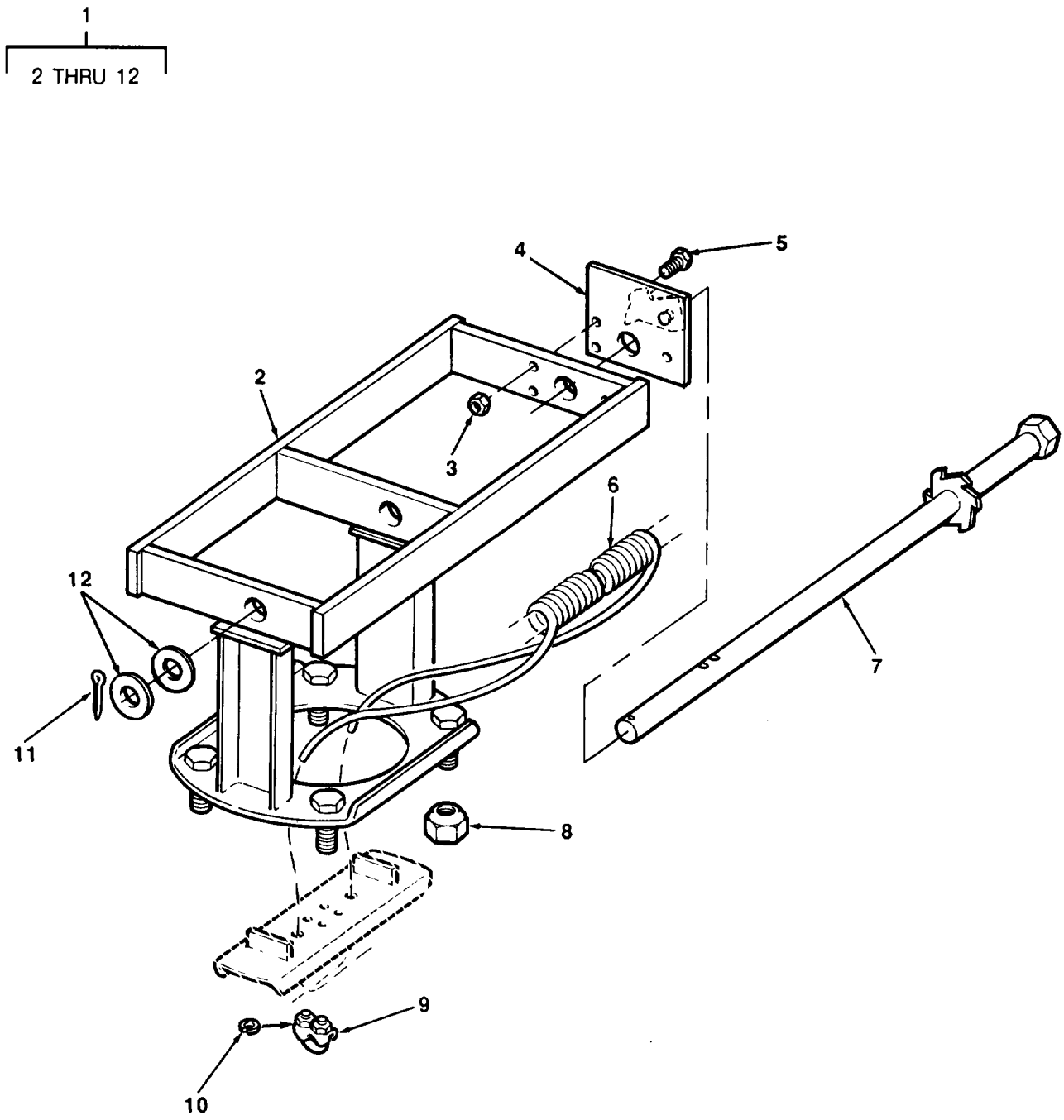

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FIGURE 11. SPARE TIRE CARRIER.

	(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
					GROUP 1504 SPARE WHEEL CARRIER AND TIRE LOCK	
					FIG. 11 SPARE TIRE CARRIER	
*	1	XDOOO	22271	D7914	CARRIER,TIRE	1
*	2	XAOZZ	22271	D9914	.MAINMEMBER (WELDER TO FRAME)	1
*	3	PAOZZ	96906	MS51922-1	.NUT,SELF-LOCKING,HE	3
*	4	PAOZZ	22271	B9912	.PAWL PLATE ASSEMBLY	1
*	5	PAOZZ	96906	MS90725-8	.SCREW,CAP,HEXAGON H	3
*	6	XDOZZ	22271	A7918	.ROPE,WIRE	1
*	7	PAOZZ	22271	B9913	.SHAFT ASSEMBLY	1
*	8	PAOZZ	09386	37888	.NUT,PLAIN,SINGLE BA	4
*	9	PAOZZ	71747	CHF-H92-1/4	.CLAMP,WIRE ROPE,SAD	2
*	10	PAOZZ	96906	MS35338-45	.WASHER,LOCK	4
*	11	PAOZZ	96906	MS24665-495	.PIN,COTTER	1
*	12	PAOZZ	96906	MS27183-27	.WASHER,FLAT	2
					END OF FIGURE	

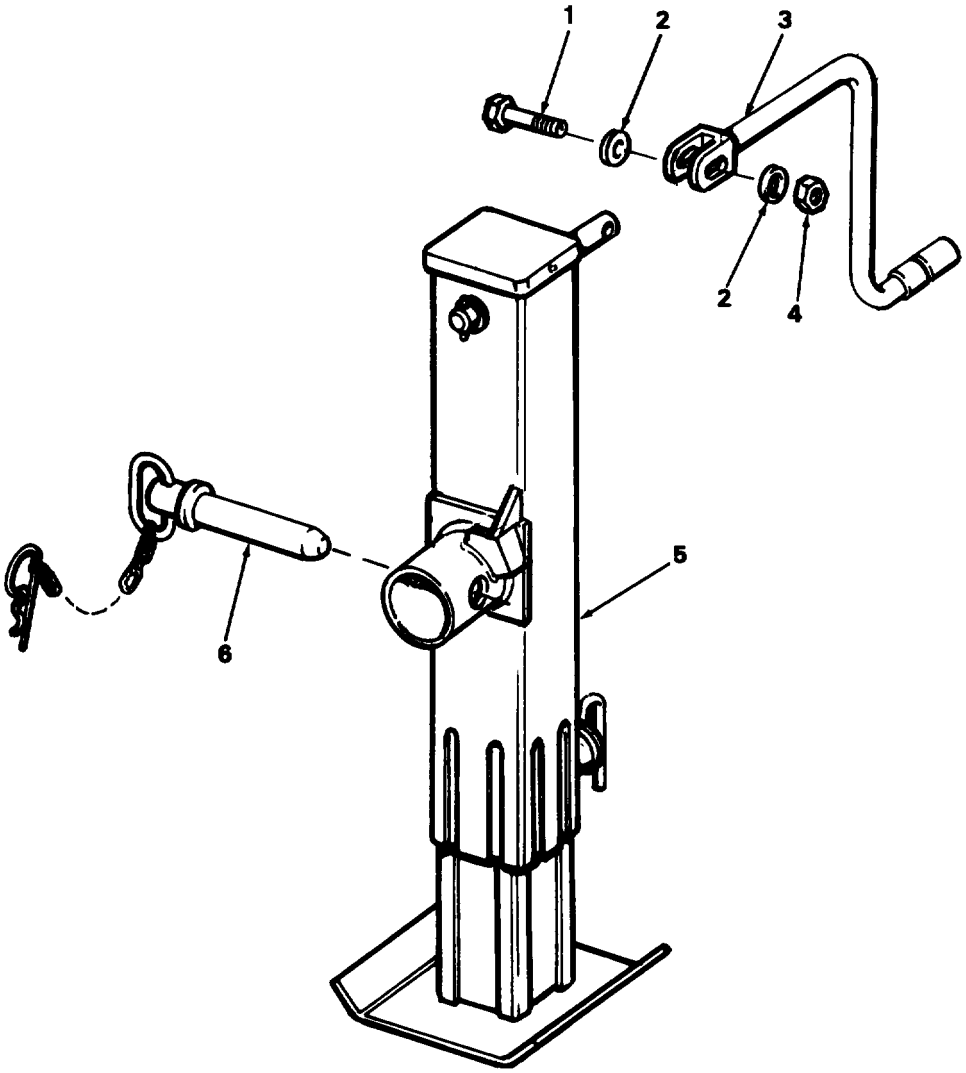

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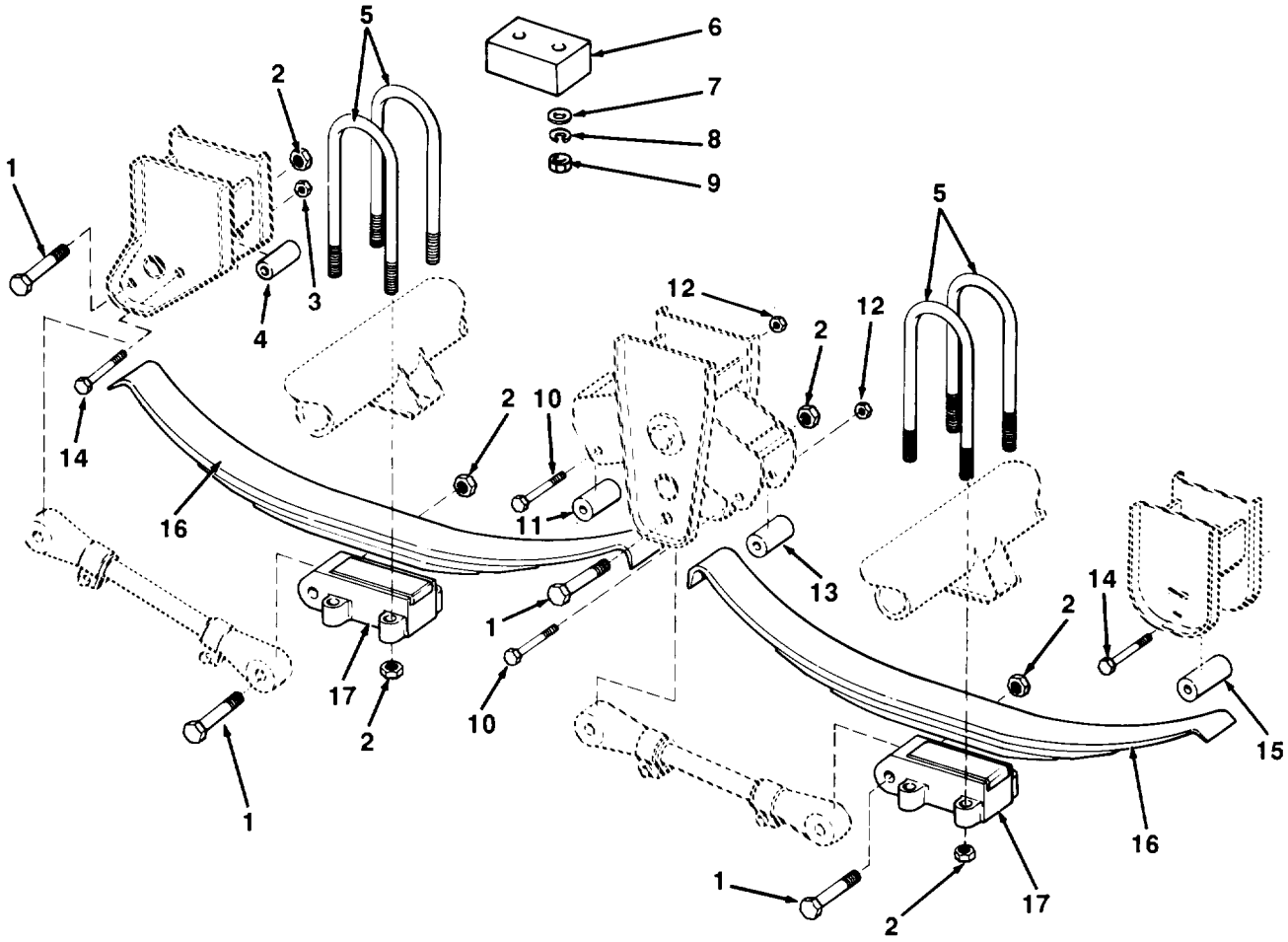
FIGURE 12. LANDING GEAR.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 1507 LANDING GEAR, LEVELING JACKS	
				FIG. 12 LANDING GEAR	
1	PAOZZ	96906	MS90725-68	.SCREW,CAP,HEXAGON H	1
2	PAOZZ	96906	MS27183-13	.WASHER PLAIN	2
3	PAOZZ	99411	LG0083-01	.CRANK,HAND	1
4	PAOZZ	96906	MS51922-17	.NUT,SELF-LOCKING,HE	1
*5	PAOZZ	1URV4	182800	.SUPPORT,RETRACTABLE	1
5	PAOZZ	22271	3870-412	.GEAR, LANDING	1
6	PAOZZ	22271	A7546	.PIN,ASSEMBLY,LOCK	1
				END OF FIGURE	



NOTE: LEFT HAND SIDE SHOWN; RIGHT HAND SIDE SAME.

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FIGURE 13. SUSPENSION AND SPRINGS.

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 16 SPRINGS AND TORQUE RODS	
				GROUP 1601 SPRINGS	
				FIG. 13 SUSPENSION AND SPRINGS	
1	PAFZZ	99062	0001-008	SCREW,CAP,HEXAGON H	8
2	PAFZZ	96906	MS35691-70	NUT,PLAIN,HEXAGON	24
3	PAFZZ	96906	MS35691-38	NUT,PLAIN,HEXAGON	6
4	PAFZZ	99062	0378	SPACER,SLEEVE	4
5	PAFZZ	1WZH5	24213-130	BOLT,U	8
6	PAOZZ	22271	430000	BUMPER,RUBBER	4
7	PAOZZ	96906	MS27183-19	WASHER,FLAT	8
8	PAOZZ	96906	MS35338-48	WASHER,LOCK	8
9	PAOZZ	96906	MS90725-117	SCREW,CAP,HEXAGON H	8
10	PAFZZ	96906	MS90727-174	SCREW,CAP,HEXAGON H	4
11	PAFZZ	99062	0741-01	SPACER,SLEEVE	2
12	PAFZZ	96906	MS35691-54	NUT,PLAIN,HEXAGON	4
13	PAFZZ	99062	0732	SPACER,SLEEVE	2
14	PAFZZ	96906	MS90727-127	SCREW,CAP,HEXAGON H	4
15	PAFZZ	99062	0727	SPACER,SLEEVE	2
16	PAFZZ	99062	0079-01X	SPRING,ASSEMBLY,LEA	4
17	PAFZZ	99062	0338-05	RETAINER,NUT AND BO	4
				END OF FIGURE	

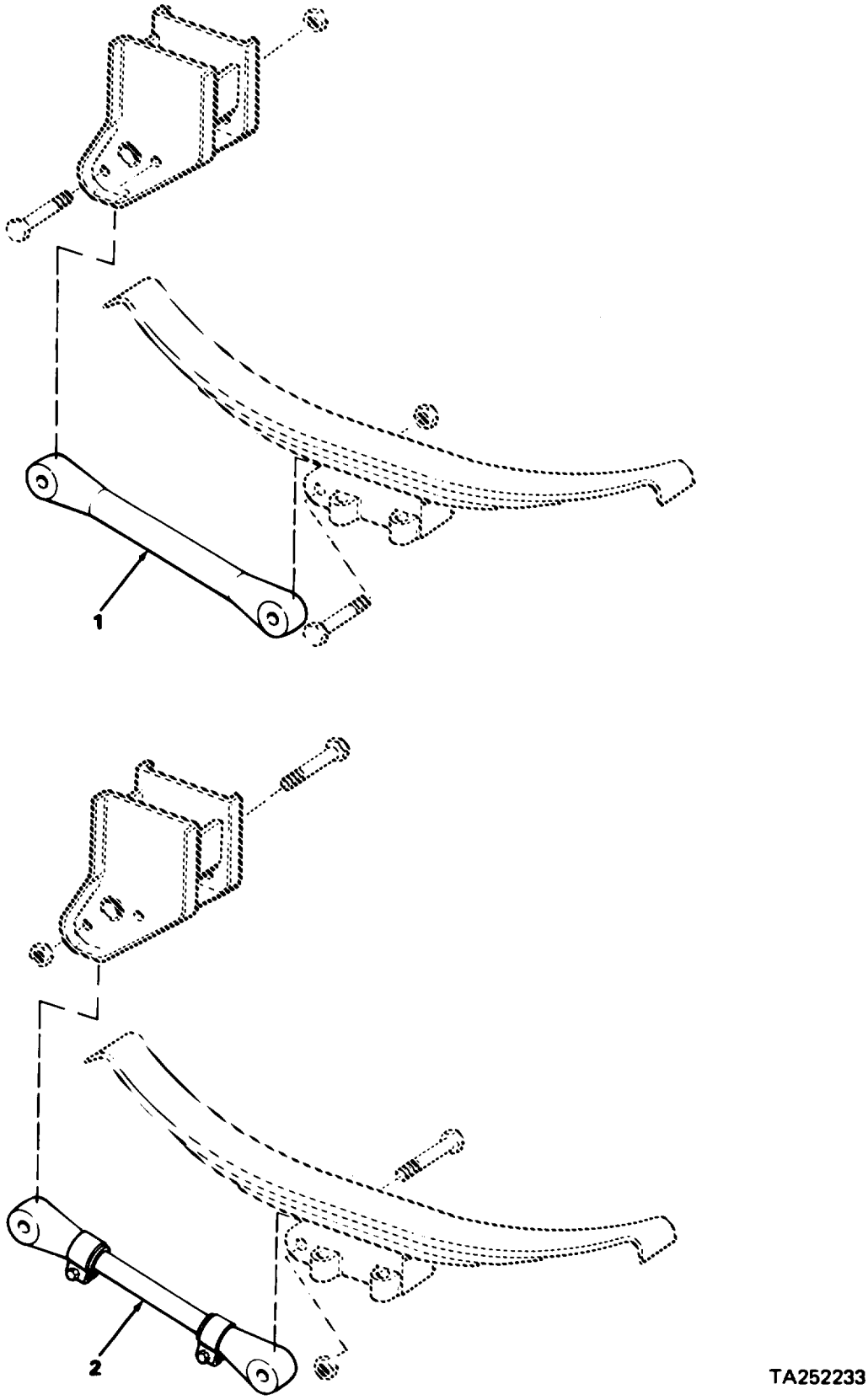

Figure 14. Torque Arms

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 1604 TORQUE RODS	
				FIG. 14 TORQUE RODS	
1	PAFZZ	92967	71500	TORQUE ROD,TANDEM A	2
2	PAFZZ	99062	1035-20	TORQUE ROD,TANDEM A	2
				END OF FIGURE	

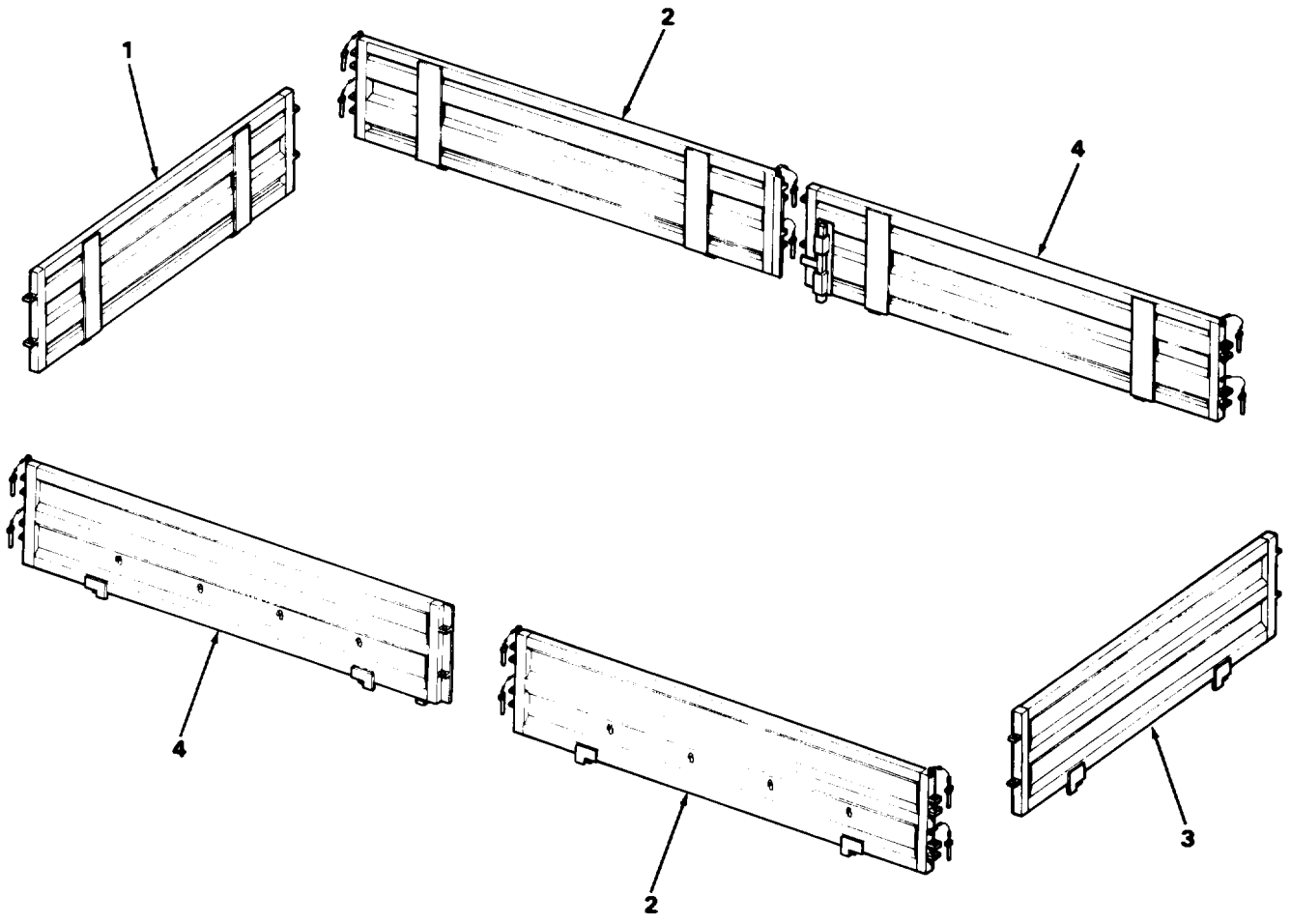

Figure 15. Gates

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 18 BODY	
				GROUP 1801 BODY	
				FIG. 15 GATES	
1	PAOZZ	22271	3800-953	STAKE,VEHICLE BODY	1
2	PAOZZ	22271	3800-951	STAKE,VEHICLE BODY	2
3	PAOZZ	22271	3800-952	STAKE,VEHICLE BODY	1
4	PAOZZ	22271	3800-950	STAKE,VEHICLE BODY	2
				END OF FIGURE	

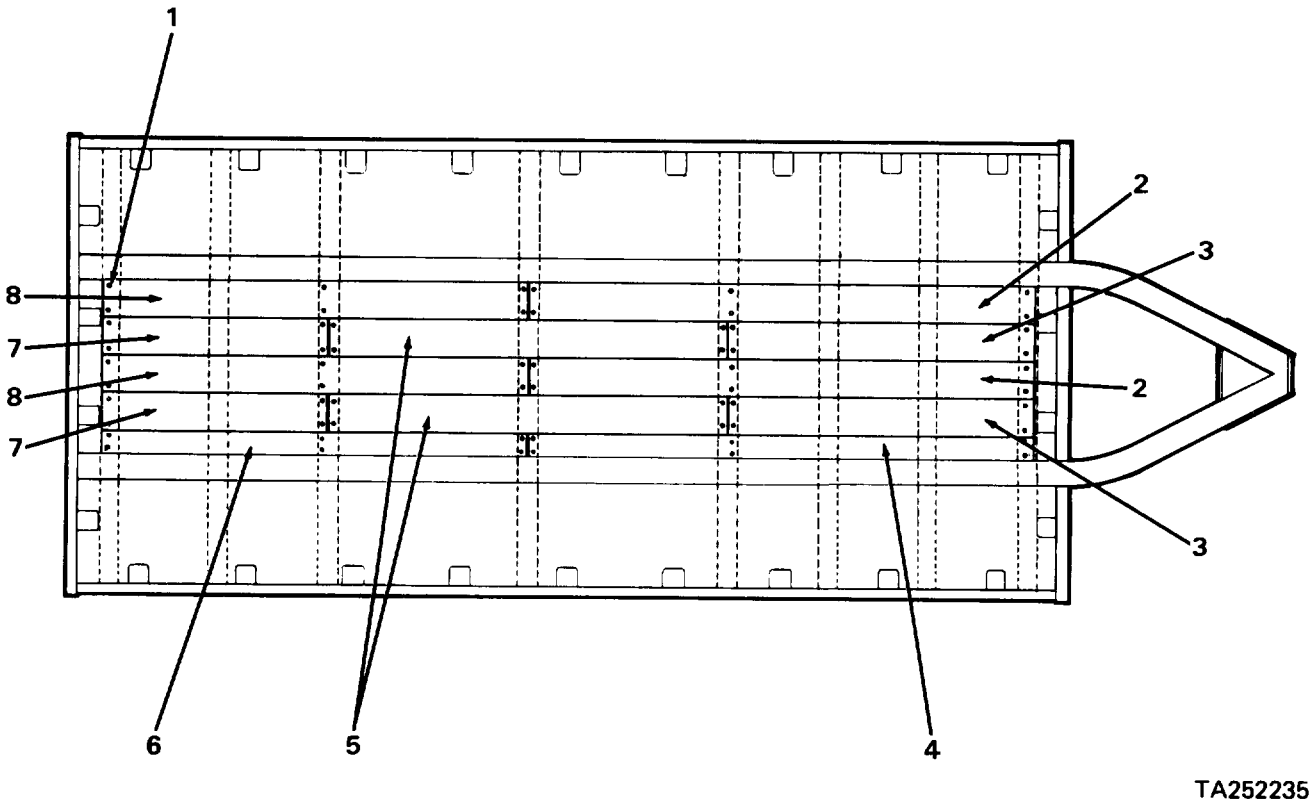

Figure 16. Floor Boards

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 1805 DECK	
				FIG. 16 FLOOR BOARDS	
1	PAFZZ	22271	3600-901	SCREW,TAPPING,THREA	64
2	MFFZZ	22271	D7907-B	BOARD,DECK MAKE FROM PART NO. A3850 -901	2
3	MFFZZ	22271	D7907-D	BOARD,DECK MAKE FROM PART NO. A3850 -901	2
4	MFFZZ	22271	D7907-G	BOARD,DECK MAKE FROM PART NO. A3850 -901	1
5	MFFZZ	22271	D7907-C	BOARD,DECK MAKE FROM PART NO. A3850 -901	2
6	MFFZZ	22271	D7907-F	BOARD,DECK MAKE FROM PART NO.A3850 -901	1
7	MFFZZ	22271	D7907-E	BOARD,DECK MAKE FROM PART NO A3850 -901	2
8	MFFZZ	22271	D7907-A	BOARD,DECK MAKE FROM PART NO. A3850- -901	2
				END OF FIGURE	

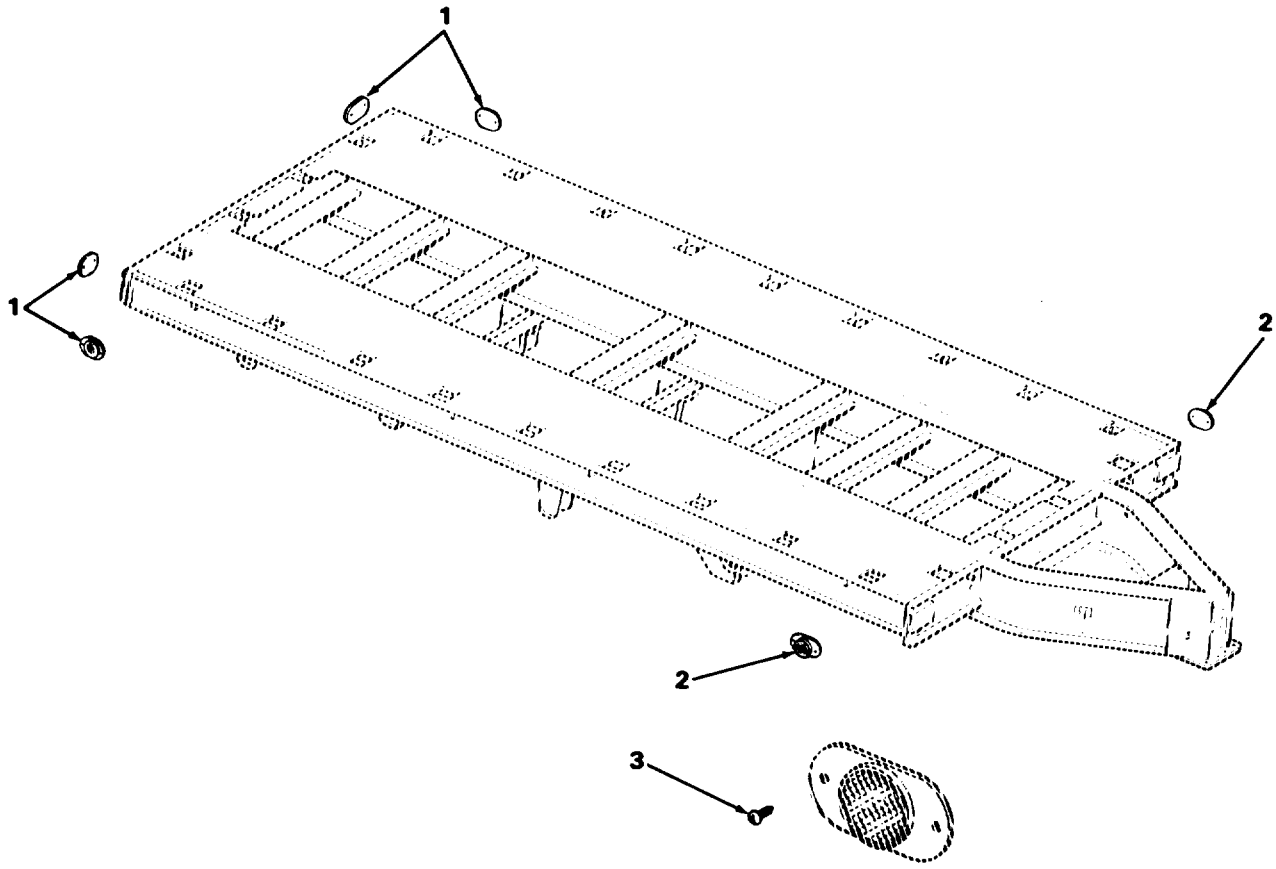

Figure 17. Reflectors

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 22 BODY CHASSIS AND HULL ACCESSORY ITEMS	
				GROUP 2202 ACCESSORY ITEMS	
				FIG. 17 REFLECTORS	
1	PAOZZ	96906	MS35387-2	REFLECTOR,INDICATIN RED	2
2	PAOZZ	96906	MS35387-1	REFLECTOR,INDICATIN AMBER	4
3	PAOZZ	96906	MS51851-45	SCREW,TAPPING,THREA	12
				END OF FIGURE	

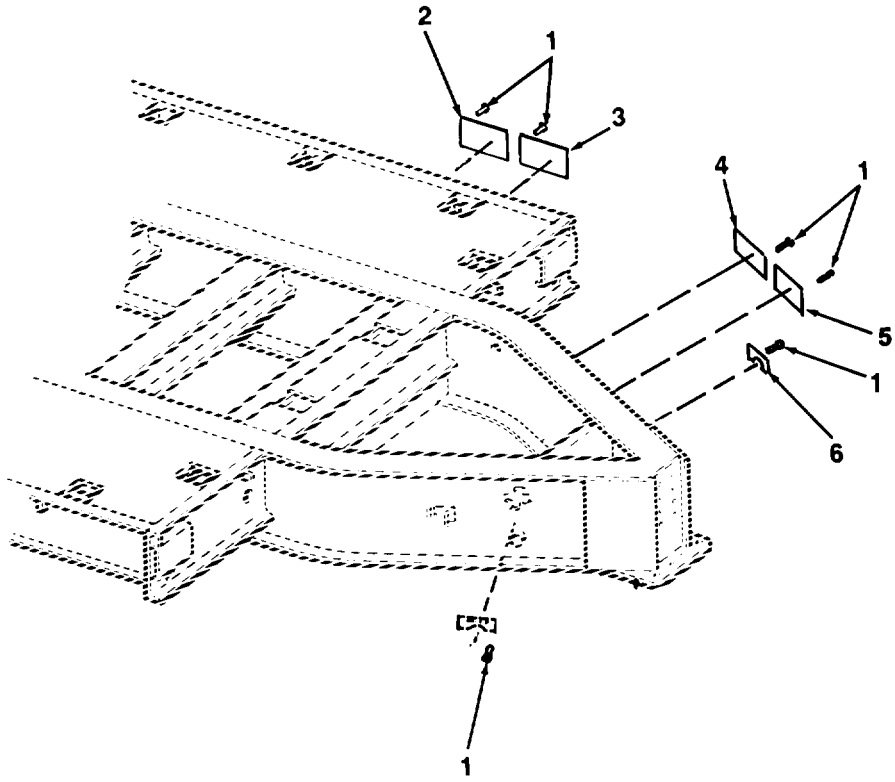

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FIGURE 18. DATA PLATES.

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				GROUP 2210 DATA PLATES	
				FIG. 18 DATA PLATES	
1	PBOZZ	07707	AD46BS	RIVET,BLIND	20
2	PBOZZ	22271	C3800-907	PLATE,ID	1
3	PBOZZ	22271	C7543	PLATE,IDENTIFICATIO	1
4	PBOZZ	22271	C3800-906	PLATE,INSTRUCTION	1
5	PBOZZ	22271	C3800-908	PLATE,INSTRUCTION	1
6	PAOZZ	22279	A7919	PLATE,IDENTIFICATIO	1
7	PAOZZ	22271	A3800921	DECAL,WARRANTY	1
				END OF FIGURE	

	(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
					GROUP 95 GENERAL USE STANDARDIZED PARTS	
					GROUP 9501 BULK MATERIAL	
					FIG. BULK	
	1	PAOZZ	81349	M13486-1-5	WIRE,ELECTRICAL	V
*	2	PAFZZ	22271	A3850-910	LUMBER,SOFTWOOD BOARD	V
					END OF FIGURE	

CROSS-REFERENCE INDEXES

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5305-00-003-9252	9	1	5310-00-584-5272	9	4
6240-00-019-0877	1	4		13	8
	1	8	5310-00-584-7888	10	3
	1	16		10	13
	1	20	5310-00-594-8038	7	1
2530-00-021-2364	5	23		11	8
5310-00-056-3395	5	6	4730-00-595-0083	5	13
5305-00-068-0502	2	11	6240-00-617-0991	1	13
4730-00-069-1186	5	17	5310-00-637-9541	1	17
5305-00-071-2233	9	12	4730-00-698-5001	5	24
5310-00-087-4652	12	4	5305-00-716-8128	9	7
5310-00-087-7493	12	2		13	9
5310-00-088-1251	2	13	6220-00-726-1916	1	7
	11	3	5305-00-726-2561	13	10
5330-00-090-2128	5	14	6220-00-752-5992	1	21
3110-00-100-0335	7	5	5305-00-762-6041	10	1
3110-00-100-0670	7	4		10	10
5935-00-115-2307	2	7	5310-00-763-8901	10	4
5305-00-115-9526	1	18		10	14
4730-00-142-3075	5	25	5310-00-763-8905	6	3
6240-00-143-3159	1	12	5310-00-768-0318	9	3
4730-00-143-9282	5	26	4730-00-771-5308	5	16
6145-00-152-6499	BULK	1	5935-00-773-1428	2	10
4730-00-172-0028	4	19	5365-00-803-7299	4	14
5325-00-174-9328	2	2	5310-00-809-3079	9	6
6220-00-179-4324	1	15		13	7
9905-00-202-3639	17	1	5310-00-809-8533	7	7
9905-00-205-2795	17	2	5310-00-809-8541	11	12
4730-00-221-2140	5	11	5310-00-833-8567	1	5
5305-00-225-3839	5	29	2610-00-840-9270	8	1
	11	5	5935-00-846-3883	2	9
5315-00-234-1626	6	5	5310-00-891-1709	9	8
5315-00-234-1664	11	11	5310-00-891-1733	13	3
5305-00-269-3218	12	1	5310-00-891-3405	13	12
5310-00-273-7771	7	1	5310-00-891-3425	10	7
4730-00-278-4822	5	7	5305-00-942-2196	5	5
5975-00-282-2707	2	1	5305-00-945-6412	13	14
4730-00-289-0155	5	22	5310-00-951-4679	5	30
3110-00-293-8997	7	15	5320-00-965-7109	18	1
3110-00-293-8998	7	14	5310-00-997-1888	9	15
6220-00-299-7425	1	3	4720-01-014-4915	5	15
6220-00-299-7426	1	9	5310-01-019-6527	13	2
5310-00-407-9566	11	10	4730-01-043-8150	5	19
5330-00-462-0907	1	14	5330-01-049-4093	7	3
4730-00-555-1764	5	1	4030-01-050-8140	10	6
2640-00-555-2829	8	2	5340-01-071-2047	5	20
6220-00-577-3434	1	2	5306-01-075-8519	9	11
6220-00-577-3435	1	19	2530-01-084-6975	6	7
5310-00-582-5965	2	12	6220-01-093-4439	1	10
	9	14	2530-01-095-3561	6	2

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STOCK NUMBER	FIG	ITEM
5325-01-105-9454	2	5
5340-01-116-4684	6	4
5315-01-121-1859	6	6
5305-01-138-7735	10	5
2530-01-147-1568	6	1
4720-01-150-3623	5	3
4720-01-216-4076	5	12
4720-01-152-5476	5	2
3040-01-153-1826	11	7
2590-01-153-1827	12	5
9905-01-153-1842	18	2
5360-01-390-6448	4	2
5360-01-153-1849	4	8
5306-01-153-1856	13	5
2530-01-153-1859	14	1
5365-01-153-1862	13	15
5365-01-153-1863	13	4
2510-01-153-1866	13	17
5340-01-153-1870	12	3
5340-01-153-1876	7	12
9905-01-153-8217	18	6
9905-01-155-3852	18	5
4010-01-155-3884	10	8
2530-01-155-3885	14	2
2530-01-155-3901	5	9
5365-01-155-3933	9	10
9905-01-155-7345	18	3
9905-01-155-7346	18	4
2530-01-155-7498	3	4
2590-01-155-7621	2	6
2540-01-156-8099	9	5
	13	6
2530-01-157-4174	7	2
5320-01-157-6210	4	5
2530-01-157-6246	4	6
2530-01-157-6247	4	4
5340-01-158-3086	5	8
5340-01-158-3269	9	20
2530-01-158-7147	4	12
3040-01-158-7163	7	9
3040-01-158-8583	11	4
2530-01-158-9212	7	8
2540-01-159-6199	10	9
5310-01-160-4550	4	18
5340-01-161-2693	12	6
5340-01-161-6239	9	17
5310-01-162-2514	3	1
5310-01-162-2522	3	2
5310-01-162-6010	3	3
3120-01-162-8657	4	7
5315-01-162-8987	4	11
2530-01-163-7340	5	4
2510-01-163-7361	15	3
2510-01-163-7362	15	1
5310-01-163-9313	7	6
5310-01-163-9317	9	23
2510-01-164-0040	15	2
2510-01-164-1847	15	4
4820-01-164-5891	5	28
2540-01-164-7252	10	2
	10	12
5305-01-164-8381	13	1
5305-01-164-9723	16	1
5315-01-165-1472	4	1
5305-01-165-5589	9	18
2510-01-165-6140	13	16
5305-01-165-7520	7	11
5330-01-165-8667	4	16
3120-01-165-8748	4	17
5365-01-166-0789	13	11
5307-01-166-3690	7	10
5365-01-166-6728	13	13
3120-01-167-2468	4	13
5305-01-167-5490	1	1
	9	22
	17	3
2590-01-169-9734	9	25
5340-01-170-1294	2	3
2590-01-170-4949	9	2
2590-01-171-4483	9	26
5340-01-171-5923	9	21
5340-01-172-5633	5	21
5310-01-173-1097	2	4
4820-01-181-5601	5	10
2510-01-188-7402	9	16
5315-01-220-6245	4	9
4030-01-212-3551	11	9
2530-01-217-8156	4	21
5975-01-230-4370	1	6
5310-01-237-2011	9	24
5310-01-237-6693	5	33
2530-01-257-7591	5	32
DELETED		
5305-01-257-7634	4	20
5306-01-257-7659	9	19
2540-01-261-4068	9	9
5510-01-263-3109	BULK	2
2530-01-352-7863	4	15
2530-01-392-8613	4	15

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CAGEC	PART NUMBER	STOCK NUMBER	FIG	ITEM
79146	AC2569	4730-00-069-1186	5	17
07707	AD46BS	5320-00-965-7109	18	1
22271	A3850-910	5510-01-263-3109	BULK	2
22271	A5200-934	5340-01-171-5923	9	21
22271	A6200-903		9	13
58536	A52484-1	4730-00-595-0083	5	13
22271	A6260-211	2590-01-171-4483	9	26
22271	A7546	5340-01-161-2693	12	6
22271	A7909	5340-01-161-6239	9	17
22271	A7918		11	6
22279	A7919	9905-01-153-8217	18	6
81349	B1821BH025C100D	5305-00-225-3839	5	29
			11	5
81349	B1821BH038C100D	5305-00-942-2196	5	5
22271	B2600-944	4720-01-216-4076	5	12
22271	B2600-942	4720-01-152-5476	5	2
80000	B2600-943	4720-01-150-3623	5	3
22271	B5200-932	2590-01-169-9734	9	25
1URV4	182800	2590-01-153-1827	12	5
22271	B9912	3040-01-158-8583	11	4
22271	B9913	3040-01-153-1826	11	7
22271	B9916	2510-01-188-7402	9	116
71747	CHF-H92-1/4	4030-01-212-3551	11	9
75272	COV-070921	5340-01-071-2047	5	20
75272	COV-1509	5340-01-170-1294	2	3
22271	C3800-906	9905-01-155-7346	18	4
22271	C3800-907	9905-01-153-1842	18	2
22271	C3800-908	9905-01-155-3852	18	5
22271	C3800-925	2540-01-261-4068	9	9
22271	C3810-230	4010-01-155-3884	10	8
79470	C5405X8	4730-00-555-1764	5	1
13174	C606	4720-01-014-4915	5	15
22271	C6260-535	5365-01-155-3933	9	10
22271	C7543	9905-01-155-7345	18	3
22271	C9005-361	2530-01-155-7498	3	4
8W862	D-7544	2540-01-159-6199	10	9
74410	DB-1385	2540-01-164-7252	10	2
			10	12
90763	D0142095-EBG	5310-01-173-1097	2	4
22271	D7545		10	11
22271	D7907-A		16	8
22271	D7907-B		16	2
22271	D7907-C		16	5
22271	D7907-D		16	3
22271	D7907-E		16	7
22271	D7907-F		16	6
22271	D7907-G		16	4
22271	D7914		11	1
22271	D9914		11	2
22271	D9934	5340-01-158-3269	9	20
02978	ERNA245	5310-00-584-5272	9	4
75535	G215	4030-01-050-8140	10	6
60038	HM212011	3110-00-293-8997	7	15
60038	HM212049	3110-00-293-8998	7	14
79146	HO-159-6	4730-00-771-5308	5	16

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CAGEC	PART NUMBER	STOCK NUMBER	FIG	ITEM
99411	LG0083-01	5340-01-153-1870	12	3
96906	MS15003-4	4730-00-172-0028	4	19
96906	MS15570-1251	6240-00-019-0877	1	4
			1	8
			1	16
			1	20
96906	MS15570-89	6240-00-143-3159	1	12
96906	MS16624-1150	5365-00-803-7299	4	14
96906	MS18154-58	5305-00-115-9526	1	18
96906	MS20913-6S	4730-00-221-2140	5	11
96906	MS24665-387	5315-00-234-1626	6	5
96906	MS24665-495	5315-00-234-1664	11	11
96906	MS27144-2	5935-00-115-2307	2	7
96906	MS27183-13	5310-00-087-7493	12	2
96906	MS27183-19	5310-00-809-3079	9	6
			13	7
96906	MS27183-23	5310-00-809-8533	7	7
96906	MS27183-27	5310-00-809-8541	11	12
96906	MS27183-3	5310-00-951-4679	5	30
96906	MS35338-44	5310-00-582-5965	2	12
			9	14
96906	MS35338-45	5310-00-407-9566	11	10
96906	MS35338-46	5310-00-637-9541	1	17
96906	MS35338-48	5310-00-584-5272	13	8
96906	MS35338-51	5310-00-584-7888	10	3
			10	13
96906	MS35387-1	9905-00-205-2795	17	2
96906	MS35387-2	9905-00-202-3639	17	1
96906	MS35420-1	6220-00-752-5992	1	21
96906	MS35421-1	6220-00-299-7425	1	3
96906	MS35421-2	6220-00-299-7426	1	9
96906	MS35423-1	6220-00-577-3434	1	2
96906	MS35423-2	6220-00-726-1916	1	7
96906	MS35424-1	6220-00-577-3435	1	19
96906	MS35478-1073	6240-00-617-0991	1	13
96906	MS35489-114	5325-00-174-9328	2	2
96906	MS35649-2252	5310-00-997-1888	9	15
96906	MS35649-2382	5310-00-056-3395	5	6
96906	MS35691-38	5310-00-891-1733	13	3
96906	MS35691-54	5310-00-891-3405	13	12
96906	MS35691-65	5310-00-891-3425	10	7
96906	MS35691-70	5310-01-019-6527	13	2
96906	MS35691-9	5310-00-891-1709	9	8
96906	MS35748-1	5330-00-090-2128	5	14
96906	MS39182-8	4730-00-143-9282	5	26
96906	MS51368-2	2640-00-555-2829	8	2
96906	MS51851-45	5305-01-167-5490	1	1
			9	22
			17	3
96906	MS51851-66	5305-00-003-9252	9	1

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CAGEC	PART NUMBER	STOCK NUMBER	FIG	ITEM
96906	MS51922-17	5310-00-087-4652	12	4
96906	MS51967-14	5310-00-768-0318	9	3
96906	MS51968-20	5310-00-763-8905	6	3
96906	MS51968-23	5310-00-763-8901	10	4
			10	14
96906	MS52125-2	6220-01-093-4439	1	10
96906	MS75021-1	5935-00-846-3883	2	9
96906	MS90725-117	5305-00-716-8128	9	7
			13	9
96906	MS90725-18	5305-00-071-2233	9	12
96906	MS90725-36	5306-01-075-8519	9	11
96906	MS90725-6	5305-00-068-0502	2	11
96906	MS90725-68	5305-00-269-3218	12	1
			11	5
96906	MS90727-127	5305-00-945-6412	13	14
96906	MS90727-174	5305-00-726-2561	13	10
96906	MS90727-189	5305-00-762-6041	10	1
			10	10
96906	MS90728-215	5305-01-138-7735	10	5
22271	M10HM100	5320-01-157-6210	4	5
22271	M10HM115	5305-01-257-7634	4	20
81349	M13486-1-5	6145-00-152-6499	BULK	1
62707	M16WB100	2530-01-217-8156	4	21
62707	M16WJ101	5360-01-390-6448	4	2
97271	M16WJ103		4	10
97271	1Z6152	5315-01-220-6245	4	9
97271	M16WKL10-236	2530-01-392-7863	4	15
97271	M16WKR10-236	2530-01-392-8613	4	15
81349	M45913/1-4CG5C	5310-00-088-1251	2	13
			11	3
06383	PLT3I	5975-00-282-2707	2	1
22337	RA-27970	2530-01-157-4174	7	2
0EAK3	SK-6006-3	4730-00-289-0155	5	22
18076	S325-G14	5340-01-172-5633	5	21
81348	ZZ-T-381/15-9.5/ P3A/G/TBHR	2610-00-840-9270	8	1
99062	0001-008	5305-01-164-8381	13	1
99062	0079-01	2510-01-165-6140	13	16
99062	0338-05	2510-01-153-1866	13	17
99062	0378	5365-01-153-1863	13	4
99062	0727	5365-01-153-1862	13	15
99062	0732	5365-01-166-6728	13	13
99062	1035-20	2530-01-155-3885	14	2
99062	0741-01	5365-01-166-0789	13	11
22271	10001	5305-01-165-7520	7	11
22271	10070	5340-01-153-1876	7	12
22271	10071		7	13
06853	101112	4820-01-164-5891	5	28
22271	10151	5310-01-163-9313	7	6

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CAGEC	PART NUMBER	STOCK NUMBER	FIG	ITEM
06853	102276		5	18
22271	10406	5310-01-162-6010	3	3
22271	10408	5310-01-162-2514	3	1
97271	10409	5310-01-162-2522	3	2
50153	11M011	2530-01-095-3561	6	2
50153	11M012	2530-01-084-6975	6	7
50153	11M018-1/2	5340-01-116-4684	6	4
50153	11M061	5315-01-121-1859	6	6
19207	11639519-2	5330-00-462-0907	1	14
19207	11639520		1	11
19207	11639535	6220-00-179-4324	1	15
22271	16029	5310-01-160-4550	4	18
22271	16033	3120-01-165-8748	4	17
22271	16034	3120-01-162-8657	4	7
22271	16055	5330-01-165-8667	4	16
22271	16101	5360-01-153-1849	4	8
97271	16130		4	3
22271	16258	2530-01-158-9212	7	8
50153	163046	2530-01-147-1568	6	1
22271	16343	2530-01-158-7147	4	12
22271	16355	5315-01-165-1472	4	1
22271	16361	5315-01-162-8987	4	11
22271	16566	2530-01-157-6246	4	6
22271	16567	2530-01-157-6247	4	4
22271	20101	3040-01-158-7163	7	9
82722	221399	5340-01-158-3086	5	8
22271	2360-442		5	31
1WZH5	24213-130	5306-01-153-1856	13	5
22271	2500-915	2530-01-163-7340	5	4
22271	2500-916	2530-01-155-3901	5	9
70485	2570	5325-01-105-9454	2	5
22271	2605-150	4730-00-698-5001	5	24
22271	3600-901	5305-01-164-9723	16	1
22271	3600-916	5310-01-163-9317	9	23
22271	3600-917	5305-01-165-5589	9	18
22271	3608-504	5306-01-257-7659	9	19
22271	3617-084	5310-01-237-6693	5	33
22271	3617-089	5310-01-237-2011	9	24
01212	370036A	5330-01-049-4093	7	3
09386	37888	5310-00-594-8038	7	1
			11	8
09386	37889	5310-00-273-7771	7	1
22271	3800-924	2590-01-170-4949	9	2
22271	3800-950	2510-01-164-1847	15	4
22271	3800-951	2510-01-164-0040	15	2
22271	3800-952	2510-01-163-7361	15	3
22271	3800-953	2510-01-163-7362	15	1
22271	3800914	2530-01-257-7591	5	32
22271	430000	2540-01-156-8099	9	5
			13	6

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CAGEC	PART NUMBER	STOCK NUMBER	FIG	ITEM
79146	56D-4	4820-01-181-5601	5	10
81343	6-4 100202BA		5	27
79146	61K-8-6	4730-00-278-4822	5	7
79146	61T-G-12X8	4730-01-043-8150	5	19
60038	653	3110-00-100-0335	7	5
60038	663	3110-00-100-0670	7	4
93061	68AB-6-2	4730-00-142-3075	5	25
06853	7012-21	2530-00-021-2364	5	23
92967	71500	2530-01-153-1859	14	1
19207	7731428	5935-00-773-1428	2	1
22271	7901	2590-01-155-7621	2	6
51831	8338566	5975-01-230-4370	1	6
51831	8338567	5310-00-833-8567	1	5
22271	9008-555	3120-01-167-2468	4	13
22271	9023-500		2	8
09386	95693	5307-01-166-3690	7	10
09386	95694		7	10

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FIG	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
BULK	1	6145-00-152-6499	81349	M13486-1-5
BULK	2	5510-01-263-3109	22271	A3850-910
1	1	5305-01-167-5490	96906	MS51851-45
1	2	6220-00-577-3434	96906	MS35423-1
1	3	6220-00-299-7425	96906	MS35421-1
1	4	6240-00-019-0877	96906	MS15570-1251
1	5	5310-00-833-8567	51831	8338567
1	6	5975-01-230-4370	51831	8338566
1	7	6220-00-726-1916	96906	MS35423-2
1	8	6240-00-019-0877	96906	MS15570-1251
1	9	6220-00-299-7426	96906	MS35421-2
1	10	6220-01-093-4439	96906	MS52125-2
1	11		19207	11639520
1	12	6240-00-143-3159	96906	MS15570-89
1	13	6240-00-617-0991	96906	MS35478-1073
1	14	5330-00-462-0907	19207	11639519-2
1	15	6220-00-179-4324	19207	11639535
1	16	6240-00-019-0877	96906	MS15570-1251
1	17	5310-00-637-9541	96906	MS35338-46
1	18	5305-00-115-9526	96906	MS18154-58
1	19	6220-00-577-3435	96906	MS35424-1
1	20	6240-00-019-0877	96906	MS15570-1251
1	21	6220-00-752-5992	96906	MS35420-1
2	1	5975-00-282-2707	06383	PLT3I
2	2	5315-00-174-9328	96906	MS35489-114
2	3	5340-01-170-1294	75272	COV-1509
2	4	5310-01-173-1097	90763	D0142095-EBG
2	5	5325-01-105-9454	70485	2570
2	6	2590-01-155-7621	22271	7901
2	7	5935-00-115-2307	96906	MS27144-2
2	8		22271	9023-500
2	9	5935-00-846-3883	96906	MS75021-1
2	10	5935-00-773-1428	19207	7731428
2	11	5305-00-068-0502	96906	MS90725-6
2	12	5310-00-582-5965	96906	MS35338-44
2	13	5310-00-088-1251	81349	M45913/1-4CG5C
3	1	5310-01-162-2514	22271	10408
3	2	5310-01-162-2522	97271	10409
3	3	5310-01-162-6010	22271	10406
3	4	2530-01-155-7498	22271	C9005-361
4	1	5315-01-165-1472	22271	16355
4	2	5360-01-390-6448	62707	M16WJ101
4	3		97271	16130
4	4	2530-01-157-6247	22271	16567
4	5	5320-01-157-6210	22371	M10HM100
4	6	2530-01-157-6246	22271	16566
4	7	3120-01-162-8657	22271	16034
4	8	5360-01-153-1849	22271	16101
4	9		97271	M16WJ104
4	10		97271	M16WJ103
4	11	5315-01-162-8987	22271	16361

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FIG	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
4	12	2530-01-158-7147	22271	16343
4	13	3120-01-167-2468	22271	9008-555
4	14	5365-00-803-7299	96906	MS16624-1150
4	15	2530-01-392-7863	97271	M16WKL10-236
4	15	2530-01-392-8613	97271	M16WKR10-236
4	16	5330-01-165-8667	22271	16055
4	17	3120-01-165-8748	22271	16033
4	18	5310-01-160-4550	22271	16029
4	19	4730-00-172-0028	96906	MS15003-4
4	20	5305-01-257-7634	22271	M10HM115
4	21	2530-01-217-8156	62707	M16WB100
5	1	4730-00-555-1764	7947D	C5405X8
5	2	4720-01-152-5476	22271	B2600-942
5	3	4720-01-150-3623	80000	B2600-943
5	4	2530-01-163-7340	22271	2500-915
5	5	5305-00-942-2196	81349	B1821BH038C-100D
5	6	5310-00-056-3395	96906	MS35649-2382
5	7	4730-00-278-4822	79146	61K-8-6
5	8	5340-01-158-3086	82722	221399
5	9	2530-01-155-3901	22271	2500-916
5	10	4820-01-181-5601	79146	56D-4
5	11	4730-00-221-2140	96906	MS20913-6S
5	12	4720-01-216-4076	22271	B2600-944
5	13	4730-00-595-0083	58536	A5284-1
5	14	5330-00-090-2128	96906	MS35748-1
5	15	4720-01-014-4915	13174	C606
5	16	4730-00-771-5308	79146	HO-159-6
5	17	4730-00-069-1186	79146	AC2569
5	18		06853	102276
5	19	4730-01-043-8150	79146	61T-G-12X8
5	20	5340-01-071-2047	75272	COV-070921
5	21	5340-01-172-5633	18076	S325-G14
5	22	4730-00-289-0155	0EAK3	SK-6006-3
5	23	2530-00-021-2364	06853	7012-21
5	24	4730-00-698-5001	22271	2605-150
5	25	4730-00-142-3075	93061	68AB-6-2
5	26	4730-00-143-9282	96906	MS39182-8
5	27		81343	100202BA
5	28	4820-01-164-5891	06853	101112
5	29	5305-00-225-3839	81349	B1821BH025C-100D
5	30	5310-00-951-4679	96906	MS27183-3
5	31		22271	2360-442
5	32	2530-01-257-7591	22271	3800914
5	33	5310-01-237-6693	22271	3617-084
6	1	2530-01-147-1568	50153	163046
6	2	2530-01-095-3561	50153	11M011
6	3	5310-00-763-8905	96906	MS51968-20
6	4	5340-01-116-4684	50153	11M018-1/2
6	5	5315-00-234-1626	96906	MS24665-387
6	6	5315-01-121-1859	50153	11M061

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FIG	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
6	7	2530-01-084-6975	50153	11M012
7	1	5310-00-273-7771	09386	37889
7	1	5310-00-594-8038	09386	37888
7	2	2530-01-157-4174	22337	RA-27970
7	3	5330-01-049-4093	01212	370036A
7	4	3110-00-100-0670	60038	663
7	5	3110-00-100-0335	60038	653
7	6	5310-01-163-9313	22271	10151
7	7	5310-00-809-8533	96906	MS27183-23
7	8	2530-01-158-9212	22271	16258
7	9	3040-01-158-7163	22271	20101
7	10		09386	95694
7	10	5307-01-166-3690	09386	95693
7	11	5305-01-165-7520	22271	10001
7	12	5340-01-153-1876	22271	10070
7	13		22271	10071
7	14	3110-00-293-8998	60038	HM212049
7	15	3110-00-293-8997	60038	HM212011
8	1	2610-00-840-9270	81348	ZZ-T-381/15-9.5/ P3A/G/TBHR
8	2	2640-00-555-2829	96906	MS51368-2
9	1	5305-00-003-9252	96906	MS51851-66
9	2	2590-01-170-4949	22271	3800-924
9	3	5310-00-768-0318	96906	MS51967-14
9	4	5310-00-584-5272	02972	ERNA245
9	5	2540-01-156-8099	22271	430000
9	6	5310-00-809-3079	96906	MS27183-19
9	7	5305-00-716-8128	96906	MS90725-117
9	8	5310-00-891-1709	96906	MS35691-9
9	9	2540-01-261-4068	22271	C3800-925
9	10	5365-01-155-3933	22271	C6260-535
9	11	5306-01-075-8519	96906	MS90725-36
9	12	5305-00-071-2233	96906	MS90725-18
9	13		22271	A6200-903
9	14	5310-00-582-5965	96906	MS35338-44
9	15	5310-00-997-1888	96906	MS35649-2252
9	16	2510-01-188-7402	22271	B9916
9	17	5340-01-161-6239	22271	A7909
9	18	5305-01-165-5589	22271	3600-917
9	19	5306-01-257-7659	22271	3608-504
9	20	5340-01-158-3269	22271	D9934
9	21	5340-01-171-5923	22271	A5200-934
9	22	5305-01-167-5490	96906	MS51851-45
9	23	5310-01-163-9317	22271	3600-916
9	24	5310-01-237-2011	22271	3617-089
9	25	2590-01-169-9734	22271	B5200-932
9	26	2590-01-171-4483	22271	A6260-211
10	1	5305-00-762-6041	96906	MS90727-189
10	2	2540-01-164-7252	74410	DB-1385
10	3	5310-00-584-7888	96906	MS35338-51
10	4	5310-00-763-8901	96906	MS51968-23

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FIG	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
10	5	5305-01-138-7735	96906	MS90728-215
10	6	4030-01-050-8140	75535	G215
10	7	5310-00-891-3425	96906	MS35691-65
10	8	4010-01-155-3884	22271	C3810-230
10	9	2540-01-159-6199	8W862	D-7544
10	10	5305-00-762-6041	96906	MS90727-189
10	11		22271	D7545
10	12	2540-01-164-7252	74410	DB-1385
10	13	5310-00-584-7888	96906	MS35338-51
10	14	5310-00-763-8901	96906	MS51968-23
11	1		22271	D7914
11	2		22271	D9914
11	3	5310-00-088-1251	96906	MS51922-1
11	4	3040-01-158-8583	22271	B9912
11	5	5305-00-225-3839	96906	MS90725-8
11	6		22271	A7918
11	7	3040-01-153-1826	22271	B9913
11	8	5310-00-594-8038	09386	37888
11	9	4030-01-212-3551	71747	CHF-H92-1/4
11	10	5310-00-407-9566	96906	MS35338-45
11	11	5315-00-234-1664	96906	MS24665-495
11	12	5310-00-809-8541	96906	MS27183-27
12	1	5305-00-269-3218	96906	MS90725-68
12	2	5310-00-087-7493	96906	MS27183-13
12	3	5340-01-153-1870	99411	LG0083-01
12	4	5310-00-087-4652	96906	MS51922-17
12	5	2590-01-153-1827	1URV4	182800
12	6	5340-01-161-2693	22271	A7546
13	1	5305-01-164-8381	99062	0001-008
13	2	5310-01-019-6527	96906	MS35691-70
13	3	5310-00-891-1733	96906	MS35691-38
13	4	5365-01-153-1863	99062	0378
13	5	5306-01-153-1856	1WZH5	24213-130
13	6	2540-01-156-8099	22271	430000
13	7	5310-00-809-3079	96906	MS27183-19
13	8	5310-00-584-5272	96906	MS35338-48
13	9	5305-00-716-8128	96906	MS90725-117
13	10	5305-00-726-2561	96906	MS90727-174
13	11	5365-01-166-0789	99063	0741-01
13	12	5310-00-891-3405	96906	MS35691-54
13	13	5365-01-166-6728	99062	0732
13	14	5305-00-945-6412	96906	MS90727-127
13	15	5365-01-153-1862	99062	0727
13	16	2510-01-165-6140	99062	0079-01
13	17	2510-01-153-1866	99062	0338-05
14	1	2530-01-153-1859	92967	71500
14	2	2530-01-155-3885	99062	1035-20
15	1	2510-01-163-7362	22271	3800-953
15	2	2510-01-164-0040	22271	3800-951
15	3	2510-01-163-7361	22271	3800-952
15	4	2510-01-164-1847	22271	3800-950

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FIG	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
16	1	5305-01-164-9723	22271	3600-901
16	2		22271	D7907-B
16	3		22271	D7907-D
16	4		22271	D7907-G
16	5		22271	D7907-C
16	6		22271	D7907-F
16	7		22271	D7907-E
16	8		22271	D7907-A
17	1	9905-00-202-3639	96906	MS35387-2
17	2	9905-00-205-2795	96906	MS35387-1
17	3	5305-01-167-5490	96906	MS51851-45
18	1	5320-00-965-7109	07707	AD46BS
18	2	9905-01-153-1842	22271	C3800-907
18	3	9905-01-155-7345	22271	C7543
18	4	9905-01-155-7346	22271	C3800-906
18	5	9905-01-155-3852	22271	C3800-908
18	6	9905-01-153-8217	22279	A7919

APPENDIX G

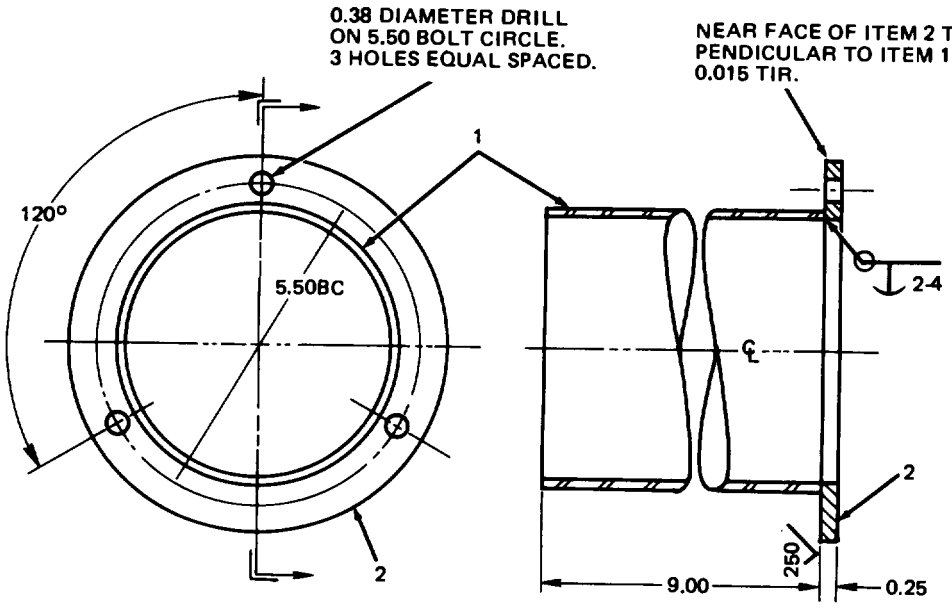
ILLUSTRATED LIST OF MANUFACTURED ITEMS

G-1 . INTRODUCTION

This appendix includes complete instructions for making items authorized to be manufactured or fabricated at organizational maintenance. A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the figure which covers the fabrication criteria. All bulk materials needed for manufacture of an item are listed in a tabular list on the illustrations.

G-2. MANUFACTURED ITEMS PART NUMBER INDEX

Part Number	Figure Number
B7924	G-4
D7907-A	G-2
D7907-B	G 2
D7907-C	G-2
D7907-D	G-2
D7907-E	G-2
D7907-F	G-2
D7907-G	G-2
EX- 1002	G-3
P-1000	G-1

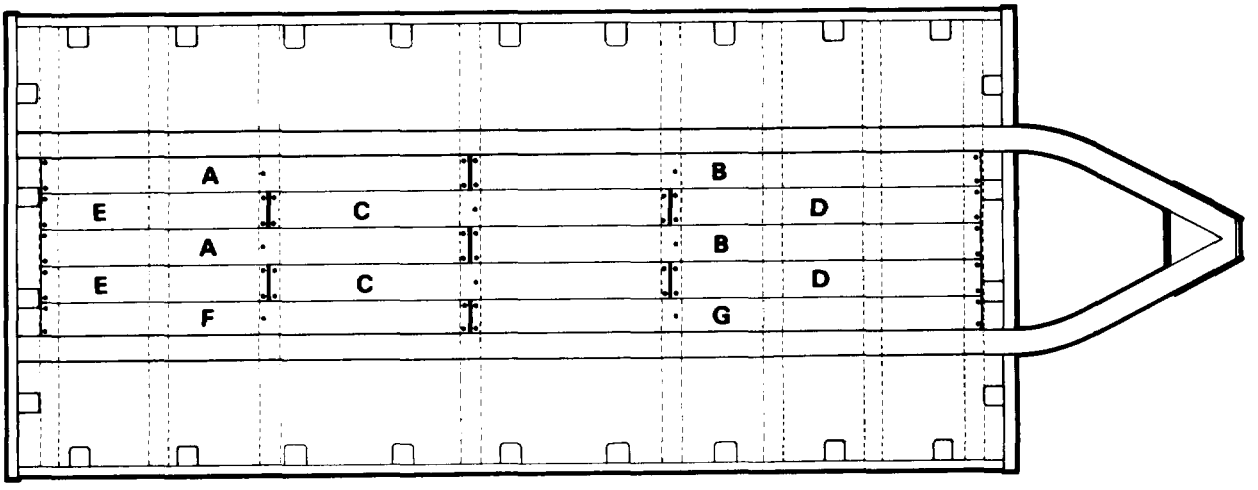


ITEM	QTY	DESCRIPTION
1	1	TUBE, 4-3/4 OD x 1/8 WALL x 9 LG, HR STEEL
2	1	FLANGE, 1/4 THICK, 6-1/2 OD x 4-1/2 ID, HR STEEL

NOTE: ALL DIMENSIONS ARE IN INCHES.

TA252211

Figure G-1. Hub Extension Part No. P-1000



PLANKING SIZE CHART

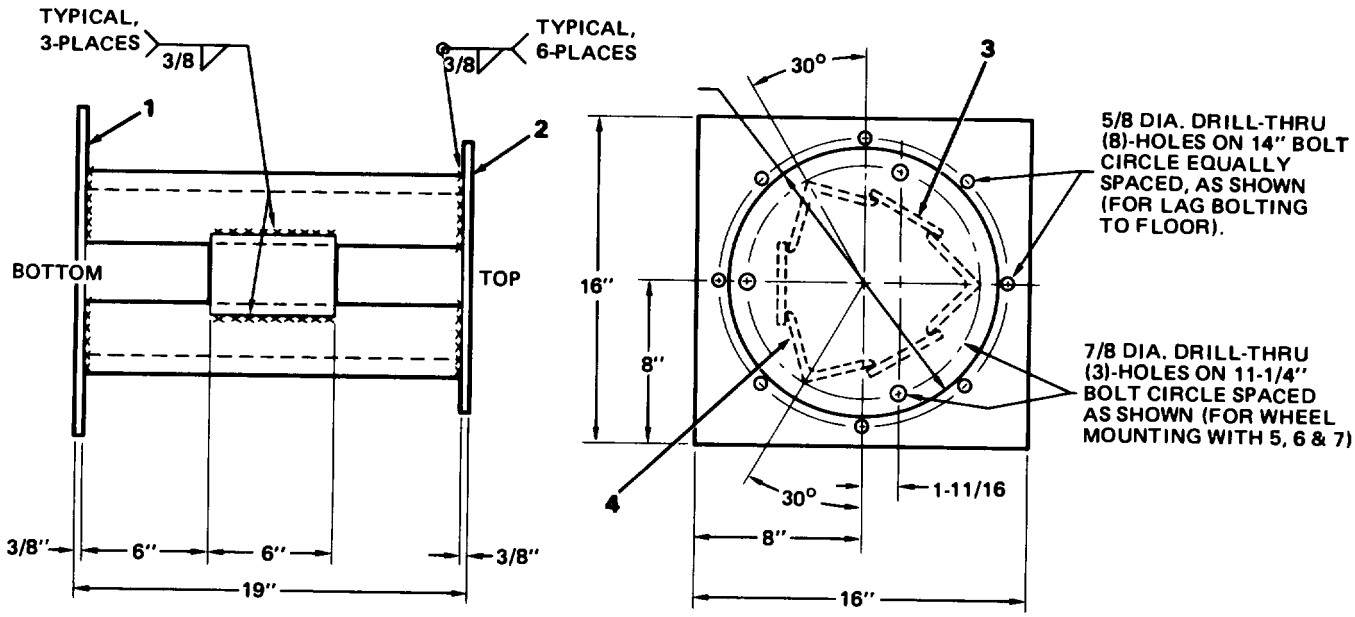
ITEM	WIDTH & LENGTH	QTY.	CUT FROM
A	7-1/2 IN. x 89-3/16 IN.	2	7-1/2 IN. x 8 FT-0 IN.
B	7-1/2 IN. x 8 FT-10-3/16 IN.	2	7-1/2 IN. x 10 FT-0 IN.
C	7-1/2 IN. x 83-7/8 IN.	2	7-1/2 IN. x 8 FT-0 IN.
D	7-1/2 IN. x 64-3/16 IN.	2	7-1/2 IN. x 10 FT-0 IN.
E	7-1/2 IN. x 47-3/16 IN.	2	DROP-OFF
F	* x 89-3/16 IN.	1	7-1/2 IN. x 8 FT-0 IN.
G	* x 8 FT-10-3/16 IN.	1	7-1/2 IN. x 10 FT-0 IN.

NOTES

1. CUT ALL FLOOR BOARDS FROM 7-1/2 INCH BY 10 FOOT FLOOR BOARD.
2. CUT FLOOR BOARDS D AND E FROM ONE LENGTH OF BOARD.
3. FLOOR BOARDS F AND G MUST BE SELECTIVELY FIT DURING INSTALLATION. 1 INDICATES VARIABLE WIDTH.

TA252212

Figure G-2. Floor Boards Part No. D7907-A THRU D7907-G



PEDESTAL INSTALLATION AND SET-UP

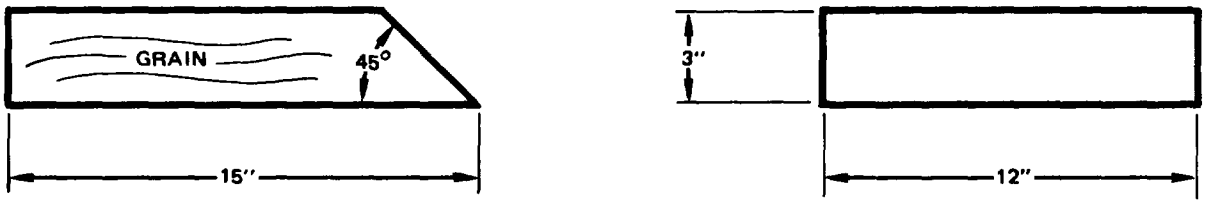
1. SECURELY LAG BOLT THE BOTTOM PLATE OF THE PEDESTAL TO CONCRETE FLOOR USING EIGHT 1/2 INCH DIA. GRADE 8 BOLTS.
2. USE ITEMS 5, 6 AND 7 TO FASTEN WHEEL AND TIRE TO TOP OF PEDESTAL.

ITEM	QTY.	DESCRIPTION
1	1	PLATE, 3/8 x 16 x 16, HR STEEL, ASTM A36
2	1	PLATE, 3/8 x 13 DIA, HR STEEL, ASTM A36
3	3	PLATE, 3/8 x 4 x 6, HR STEEL, ASTM A36
4	3	ANGLE, 3/8 x 3-1/2 x 3-1/2 x 18-1/4, STEEL, ASTM A36
5	3	BOLT, HEX HEAD, 3/4-16NF x 2, GRADE 8 STEEL
6	3	NUT, PLAIN, HEX, 3/4-16NF, GRADE 8 STEEL
7	3	WASHER, FLAT, HEAVY, 3/4, STEEL

NOTE: ALL DIMENSIONS ARE IN INCHES

TA252239

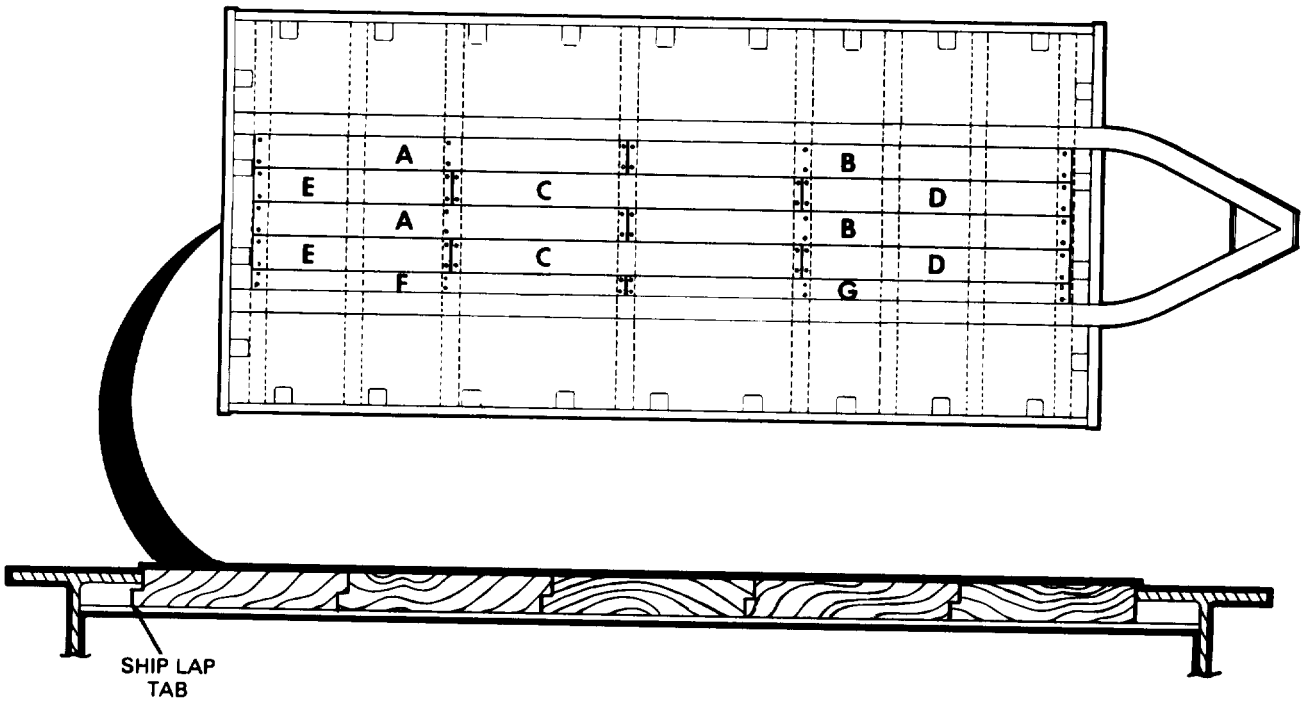
Figure G-3. Tire Mounting Pedestal Part No. EX-1002



MATERIAL: HARDWOOD BLOCK (GRAIN PARALLEL TO 15 LENGTH.
NOTE: TREAT WOOD WITH WOOD PRESERVATIVE.

TA252240

Figure G-4. Tire Changing Block Part No. B7924



PLANK CHART, SHIP LAP			
LTR.	FACE X LENGTH	PCS. REQ.	CUT FROM RANDOM LENGTHS
A	7-1/2 IN. x 89-3/16 IN.	2	9 FT. to 14 FT.
B	7-1/2 IN. x 8 FT.-10-3/16 IN.	2	
C	7-1/2 IN. x 83-7/8 IN.	2	
D	7-1/2 IN. x 64-3/16 IN.	2	DROP-OFFS FROM A, B & C
E	7-1/2 IN. x 47-3/16"	2	
F*	7-1/2 IN. x 89-3/16 IN.	1	9 FT. to 14 FT.
G*	7-1/2 IN. x 8 FT.-10-3/16 IN.	1	

NOTES

1. CUT ALL BOARDS FROM 7-1/2 INCH BY 14 FOOT FLOOR BOARD.
2. USE DROP-OFFS FROM BOARDS A, B AND C TO MAKE UP BOARDS D AND E.
3. FLOOR BOARD F AND G MUST BE SELECTIVELY FIT DURING INSTALLATION.
   * INDICATES VARIABLE WIDTH.
4. SHIP LAP TABS TO BE TOWARD LEFT (ROAD) SIDE OF TRAILER.

TA252255

Figure G-5. Ship Lap Floor Boards Part No. D7907A THRU D7907G (D REV)

APPENDIX H

TORQUE LIMITS

H-1. GENERAL

Use a torque wrench to check torque or tighten nuts and capscrews to specified torque. Special torque values are indicated in the maintenance procedures. For standard torque values should be used for other threaded fasteners. Refer to following tables H-1 and H-2.

Table H-1. Standard Torque Values

SUGGESTED TORQUE VALUES ± 5 PERCENT TO PRODUCE CORRESPONDING BOLT LOADS						
	SAE GRADE 5			SAE GRADE 8		
	Clamp Load	Assembly Torque		Clamp Load	Assembly Torque	
Size	(lbs.)	Dry (lb-in.)	Lube (lb-in.)	(lbs.)	Dry (lb-in.)	Lube (lb-in.)
1/4-20	2020	8	75	2860	12	9
1/4-28	2320	10	86	3280	14	10
5/16-18	3340	17	13	4720	25	18
5/16-24	3700	19	14	5220	25	20
3/8-16	4940	30	23	7000	45	35
3/8-24	5600	35	25	7900	50	35
7/16-14	6800	50	35	9550	70	55
7/16-20	7550	55	40	10700	80	60
1/2-13	9050	75	55	12750	110	80
1/2-20	10700	90	65	14400	120	90
9/16-12	11600	110	80	16400	150	110
9/16-18	12950	120	90	18250	170	130
5/8-11	14400	150	110	20350	220	170
5/8-18	16950	180	130	23000	240	180
3/4-10	21300	260	200	30100	380	280
3/4-16	23800	300	220	33600	420	320
7/8-9	27000	400	300	41600	600	460
7/8-14	29800	440	320	45800	660	500
1-8	35500	580	440	54500	900	680
1-12	38800	640	480	59700	1000	740

Table H-2. Self-Locking Nut Breakaway Torque Values

Thread Size	Minimum Breakaway Torque (lb -in.)	Thread Size	Minimum Breakaway Torque (lb -in.)
10-32	2.0	5/8-18	32.0
1/4-28	3.5	3/4-16	50.0
5/16-24	6.5	7/8-14	70.0
3/8-24	9.5	1-12	90.0
7/16-20	14.0	1-1/8-12	117.0
1/2-20	18.0	1-1/4-12	143.0
9/16-18	24.0		

NOTE

To determine breakaway torque, thread nut onto screw or bolt until at least two threads stick out. Nut shall not make contact with a mating part. Stop the nut. Torque necessary to begin turning nut again is the breakaway torque. Do not reuse self-locking nuts that do not meet minimum breakaway torque.

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- Tubing and Fittings, 4-17b

Air Chambers (see air brake chambers)

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By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

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The Adjutant General

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

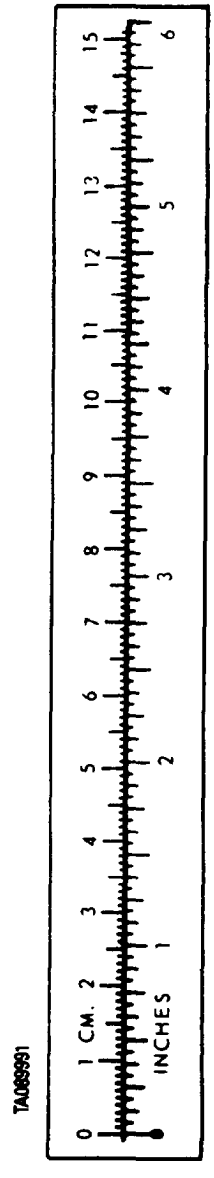
TEMPERATURE

$\frac{5}{9}(°F - 32) = °C$
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
$\frac{9}{5}(°C + 32) = °F$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



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